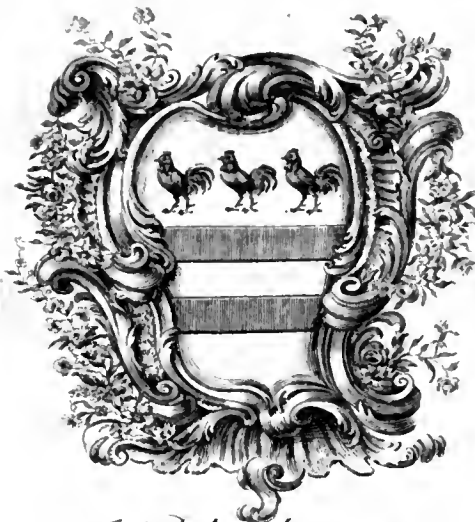






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Imprimatur hic Liber,
cui titulus,
The Natural History of Oxford-shire.

R A: BATHURST,

Vice-Cancellor. O X O N.

April, 13. 1676.

THE
NATURAL HISTORY
OF
OXFORD-SHIRE,
Being an Essay toward the *Natural History*
OF
ENGLAND.

By R. P^{er}LL. D.

— πάντα γὰρ ἔγω
Ἐκ Διὸς ἀνθρώποι γινώσκωμεν, ἀλλ' ἐπὶ πολλὰ
Κέρυμμαι. Arat. in Phænom.



Printed at the THEATER in OXFORD, and are to be had there;
And in London at Mr. S. Millers, at the Star near the
West-end of St. Pauls Church-yard. 1677.

The price in sheets at the Prefs, nine shillings.
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NATURAL HISTORY OF OREGON

OF THE STATE OF OREGON

BY J. M. COVILLE

OF THE STATE OF OREGON

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To the most Sacred Majesty of
Charles the Second,

*By the Grace of GOD,
 King of Great Britan, France and Ireland,
 Defender of the FAITH, &c.*

May it please Your Majesty,



I had certainly been an unpardonable presumption for so mean a person as the Author of this Essay, to have presented Your Majesty with a yet meaner discourse, had not the subject of it alwaies deserved the notice, and the Enquirers into it, the favor of Princes. Thus had *Aristotle* in writing his Treatise of Animals the assistance of *Alexander*; and *Pliny* the Patronage of *Titus Vespasian* to his Natural History.

Beside, this attempt seems more justly to belong to Your Majesty, than any of their Histories to their respective Patrons, it being so far from exceeding Your Majesties Dominions, that it contains but an Enquiry into one of the smallest parts of them; viz. Your alwaies Loial County and University of *Oxford*, whereas their Volumes are bounded only with the Universe.

The Epistle Dedicatory.

Yet what more particularly moved me to present it to Your Majesty, is not only Your favor to Learning in general, and especially to this place; but much more Your Majesties exquisit insight into the matter it self, insomuch that though the former might have given me some confidence of Your Majesties acceptance, yet it seems more my interest to appeal to Your Judgment, and humbly to implore Your Majesties decision, Whether if *England* and *Wales* were thus surveyed, it would not be both for the honor, and profit of the Nation?

Which design, if Your Majesty think fit to disapprove, it will yet be some satisfaction to the Author, that he has shewed his ready (though misguided) zeal to serve his Country: But if Your Majesty shall judge it advantageous to the Kingdom, or but any way worthy Your Majesties diversion, there shall none more industriously and chearfully proceed in it, than

Your Majesties most Loial

and

most obedient

Subject,

Rob. Plot.

To the Reader.

T*Hough this Essay has swell'd to so much greater a Bulk than ever I expected it could possibly have done, that I might well have superseded any further address than that of Dedication; yet it being but necessary to acquaint the Reader with some matters, that are general, and will serve for all other Counties as well as this, I thought good to put them down briefly as followeth.*

And first, that though I dare not pretend the Map of Oxfordshire prefixt to this Essay, is so accurate as any I shall make hereafter; yet I dare promise the Reader it far exceeds any we had before; for beside that it contains all the Mercat Towns, and many Parishes omitted by Saxton, Speed, &c. it shews also the Villages, distinguished by a different mark and character, and the Houses of the Nobility and Gentry, and others of any magnitude within the County; and all these with their bearings to one another, according to the Compass.

And as for the distances, though I dare not promise them Mathematically exact (which by reason of the risings and fallings of the ground, interpositions of Woods, Rivers, &c. I think scarce possible in many places to be given at all) yet some few of them are as true, as actual dimensuration, and most of them as the doctrine of Triangles, and the best information, all compared together, could direct me to put them: So that provided they have not been moved in the Graving (as I think they have but little) I take them all seated not far from the truth.

As for the scale of miles, there being three sorts in Oxfordshire, the greater, lesser, and middle miles, as almost every where else; it is contrived according to the middle sort of them; for these I conceive may be most properly called the true Oxfordshire miles, which upon actual dimensuration at several places, I found to contain for the most part 9 furlongs and a quarter, of which about 60 answer a Degree: Where by the way its but expedient that the Reader take notice, that I intend not that there are 60 of these miles in a degree, according to the common account; for reckoning 5280 feet, (or eight

To the Reader.

furlongs) to a mile, as is usual in England, no less than 69 will correspond to a degree; upon which account it is and no other, that of the middle Oxford-shire miles, each containing 9 furlongs and a quarter, about 60 will do it.

According to these miles, the degrees of North latitude are divided into minutes on each side the Map, chiefly made off from the exact Northern latitude of Oxford, collected from the many years observations of Dr. Banbridg, and at last concluded to be seated in the 46 minute of the 51 degree, proxime; the 52nd degree beginning at the small line passing through Mixbury, Clifton, north of Deddington, the two Barfords, South Nuneton, and between Hoke Norton and the Lodge: By which division 'tis easie to know to a minute of a degree, nay almost to a second, in what latitude every Town, Parish, Village, and Gentlemans House is seated.

Beside, for the Houses of the Nobility and Gentry, this Map is so contrived, that a Foreigner as well as English-man, at what distance soever, may with ease find out who are the Owners of most of them; so as to be able to say that this is such or such a Gentlemans House: And all this done by Figures put to every such House, which referring again to Figures of the same value, placed in order over the Arms in the Limb of the Map, shew in the bottom of each Shield the Nobleman or Gentlemans name, whose house it is; their respective Coats of Arms being always placed between the Figure and Name: which too (all but some few) are cut in their metals, furs, or colours, as born by their Owners.

And not only the Shields, but Ordnaries, Charges, Differences, &c. where they are not too small: if Argent, being left white; if Or, filled with small points; if Gules, lineated perpendicularly, or in pale; if Azure, horizontally, or fess-ways; if Vert, obliquely or bend-ways; if Sable, both pale and fess-ways, as may be seen in the Map, which are all the colours made use of there: And if ever hereafter I shall meet with any bearing Purpure, Ten, or Sanguine; the first shall be represented with Lines in bend sinister; Ten, with lines salter-ways, mixt of Vert and Purpure; and Sanguine, paly bendy, mixt of Gules and Purpure.

According to this method, not only the Arms of the University, all the Colleges, and Towns incorporate in the County (which I have placed in the upper margin of the Map) but on the sides and bot-

To the Reader.

tom, those of the Nobility and Gentry, are industriously ranged in Alphabetical order, to avoid the difficulties that might otherwise have risen about precedence: which, beside the use above mentioned of discovering the Owners of the Houses, and that they are an ornament to the Map, I hope may also have these other good effects.

1. That the Gentry hereby will be somewhat influenced to keep their Seats, together with their Arms, lest their Posterity hereafter, not without reflexions, see what their Ancestors have parted with. And secondly, Vagabonds deterr'd from making counterfeit Passes, by putting false names and Seals to them, both which may be discovered by such Maps as these.

To these add the ancient houses of Kings, the principal Seats of ancient Baronies, ancient Ways, Fortifications, and the sites of Religious houses, all distinguish'd as described by their respective marks in the Table for that purpose. All which put together, make the sum of the Map, as I intend they shall in all others hereafter, so that those Memento's need no more be repeated, since they are designed to be applied to all following Maps as well as this.

Yet this Map, though it contains near five times as much as any other of the County before, partly by reason of its being the first I ever made, and partly because, either of the pure ignorance or absence of some, and over curious pievishness that I met with amongst others, is not so perfect, I confess, as I wish it were; there being upon these accounts, some few Arms omitted, and others out of place at the foot of the Map, and perhaps here and there a Village overlook'd: wherefore I have entertained some thoughts of cutting it again, and perhaps somewhat larger, to be hung up in Frames (without alteration of this for the Book) with all the defects above-mentioned supplied; provided such Gentry as find their Arms omitted, or any Villages near them containing ten houses (under which number I seldom think them worth notice) please to bring in their Arms in colours, with the particular bearings and distances of their Houses and Villages, from the most noted place near them, to the Porter or one of the Keepers of the Bodleyan Library, who will be ready to receive them, or any other Curiosity of Art or Nature, in order to the compiling an Appendix to this Work, to be Printed apart.

Which is all concerning the Map, but that the Reader also note,
that

To the Reader.

that the Right Honorable the Earl of Berkshire, Lord Lovelace, &c. are designedly left out, in regard that though they have Estates and Seats in this County, yet their chiefest, and places of most common residence being elsewhere, I have chosen rather to omit them here, and to place them in those that seem their more desirable Counties.

Concerning the History it self, I can advise little more, but that I undertook it at first for my own pleasure, the subject of it being so pleasant, and of so great variety, that it surpris'd me to think how many Learned Ages had past (careful and laborious enough in compiling the Civil and Geographical Histories of England) without so much as ever attempting that of Nature or Arts: it seeming to be a design (had the Undertaker been suitable) more highly deserving of the publick too, than either of the former, as tending not only to the advancement of a sort of Learning so much neglected in England, but of Trade also, which I hope in some measure is made to appear in the following Treatise.

Which though sufficient to justify my choice of this subject, yet I ventured not upon it without the joint approbation of the most knowing in these matters, such as the Honorable Robert Boyle Esq; Dr. Willis, Dr. Wallis, Dr. Bathurst, &c. whose celebrated names serving to remove the groundless suspicions many had of the attempt, I proceeded to give this Specimen of it: Wherein the Reader is only desired to take notice, that most of the Curiosities, whether of Art, Nature, or Antiquities engraven in the Cuts, are so certain truths, that as many as were portable, or could be procured, are in the hands of the Author. But for such things as are inseparable from their places, they remain to be seen as in the History directed, there being nothing here mention'd, but what either the Author has seen himself, or has received unquestionable testimony for it, which for the most part, if not alwaies, the Reader will find cited.

*In the Philosophical part, I have chiefly embraced the Principles of Dr. Willis, as the most universally known and received, and therefore most likely (in this inquisitive Age) to be the truest; which if I have any where mis-applied (as 'tis manifold odds some where or other I may) yet I doubt not but the Learned and sober Reader will candidly accept of the honesty of my endeavor in excuse of my Error. But as for the hot-headed half-witted Censurer, who perhaps only looks on the Title of a Chapter, or here and there a Paragraph that makes for
his*

To the Reader.

his turn, I must and do expect the lash of his tongue, it being indeed his business to find out the lapses, and decry all attempts, wherein (forsooth) he himself has not been consulted: But I would have such to know (that if I meet with but proportionable encouragement from the former) 'tis not all they can say or do, shall discourage me from my purpose; for if I have erred in any thing, I shall gladly receive the calm reproofs of my Friends, and still go on till I do understand my business aright, in the mean time contemning the verdict of the ignorant and fastidious that throw words in haste.

THE

THE
NATURAL HISTORY
OF
Oxfordshire.

CHAP. I.

Of the Heavens and Air.

OXFORD, being not undeservedly by Mr. Camden stiled, *Our most noble Athens, The Muses seat, and, One of Englands Pillars; nay, The Sun, The Eye, &c.* It would have occasion'd as strange a remark, as any to be mention'd in this whole Essay, had there not some eminent Celestial Observations been made in this County; especially since that stupendous Mathematical Instrument, now called the *Telescope*, seems to have been known here above 300 years ago. But these being chiefly matters of Art, relating either to the discovery of the magnitude, figure, or determination of the motions of the Heavenly Bodies, must be referr'd (as most proper) to the end of this Work; it being my purpose in this *History of Nature*, to observe the most natural method that may be.

2. And therefore I shall consider, first, Natural Things, such as either she hath retained the same from the beginning, or freely produces in her ordinary course; as *Animals, Plants, and the universal furniture of the World.* Secondly, her *extravagancies and defects*, occasioned either by the exuberancy of matter, or obstinacy of impediments, as in *Monsters.* And then lastly, as she is restrained, forced, fashioned, or determined, by Artificial Operations. All which, without absurdity, may fall under the general notation of a *Natural History*, things of Art (as the Lord Bacon well observeth) not differing from those of Nature in *form and essence*, but in the *efficient* only; Man having no power

over Nature, but in her matter and motion, *i. e.* to put together, separate, or fashion natural Bodies, and sometimes to alter their ordinary course.

3. Yet neither shall I so strictly tie my self up to this method, but that I shall handle the two first, *viz.* The several *Species* of natural things, and the errors of Nature in those respective *Species*, together ; and the things Artificial in the end apart : Method equally begetting iterations and prolixity, where it is observed too much, as where not at all. And these I intend to deliver as succinctly as may be, in a plain, easie, unartificial Stile, studiously avoiding all ornaments of Language, it being my purpose to treat of Things, and therefore would have the Reader expect nothing less then Words : Yet neither shall my Discourse be so jejune, as wholly to consist of bare Narrations, for where the subject has not at all, or but imperfectly been handled, I shall beg leave either to enlarge, or give my opinion.

4. Since then the Celestial Bodies are so remote, that little can be known of them without the help of Art, and that all such matters (according to my proposed method) must be referred to the end of this Book : I have nothing of that kind to present the Reader with, that's local, and separate from Art, but the appearance of two *Parhelia* or mock-Suns, one on each side of the true one, at *Ensbam* on the 29th of *May*, early in the morning, in the year 1673. With them also appeared a great circle of light concentrical to the true Sun, and passing through the disks of the spurious ones, as in *Tab. 1. Fig. 1.* which though I saw not the *Phænomenon*, is as truly drawn (for so it was confessed by some that did) as I could possibly have done it if personally present ; and yet so incurious was the amazed multitude, that they could not so much as give me ground to guess at the *diameter* of the circle, much less whether it were interrupted in some of its parts, or intersected (as they usually are) with any other circles of a fainter colour.

5. Whether these appearances are caused by reflection or refraction in the Clouds, according to the old Philosophy ; or by both, in a great annulary cake of Ice and Snow, as *Des Cartes* ; or by semiopaque *Cylinders*, as *M. Hugen de Zulichem*, will be too tedious here to dispute. Let it therefore at present suffice, that this *Phænomenon* is worthy our notice, in regard,

1. That

1. That no circle passes through the true Suns disk, nor the spurious ones found in the interfection of two *Irides*, as in those that appeared at *Rome*, *March 20. 1629.* ^b and in *France*, *April 9. Anno 1666.* ^c

2. That whereas generally such mock-Suns appear not so bright, nor are so well defined as the true one is; these according to the agreement of all, appeared of so even and strong a light, that 'twas hard to distinguish the true from the false, and perhaps might not be inferior to the *Parbelia* mention'd by *Cardan* ^d, or that lately were seen in *Hungary*. ^e

6. When they appear thus bright and illustrious, Astrologers heretofore always presaged a Triumvirate: thus the Triumvirate of *Antonius*, *Augustus*, and *Lepidus*, with all the evils that attended it, was referred to the *Parbelia* seen a little before; and herein *Cardan* is so positive, that he fears not to assert, That after such an appearance, we seldom (if ever) fail of one, and therefore refers the *Parbelia* seen by himself to the Triumvirate of *Henry the second King of France*, *Charles the fifth*, and *Solyman the Turkish Emperor*. And truly, were not these to be more than suspected of vanity, it were easie to adapt a Triumvirate to ours: But my Religion, and that God that hath exhorted us, *not to be dismayed at the signs of Heaven*, and solemnly professes, that 'tis even He that frustrates the tokens of the *Lyars*, and makes the *Diviners mad* ^f, has taught me to forbear. I shall therefore add no more concerning these things, but that though most commonly the *Parbelia* with the true Sun, appear but three in number, yet that sometimes more have been seen; as four ^g in *France*, *Anno 1666.* five ^h at *Rome*, *Anno 1629.* five ⁱ in *England*, *Anno 1233.* and six ^k *Anno 1525.* by *Sigismund the first, King of Poland*; which are the most that we read were ever seen at a time, though *Des Cartes* endeavors to shew 'tis possible there may be seven.

7. And indeed this had been all I thought I should have mentioned concerning the Heavens, but that even now while I am writing this, at *Oxon:* on the 23^d of *November*, *Anno 1675.* about 7 at night, behold the Moon set her Bow in the clouds, of a white

^b *Des Cartes Meteor. cap. 10.* & *Gassend. in Ep. ad Renerium.* ^c *Philos. Transf. num. 13.* ^d *De rerum Varietate lib. 14. c. 70.* ^e *Philos. Transf. numb. 47.* ^f *Isa. 44. v. 24, 25.* ^g *Philos. Transf. numb. 13.* ^h *Des Cartes, Meteor. cap. 10.* ⁱ *Matthæw Paris, 17 Henr. III.* ^k *Des Cartes Meteor. cap. 10.* & *Fromond. Meteor. Lib. 6. Art. 2.*

colour, entire and well determined, which continued so for about half an hour after I first saw it. The reason why such appear not of divers colours, as Rain-bows do that are made by the Sun, has been alwaies ascribed by Philosophers, to the weakness of the Moons raies, not entring so deeply into the opacity of the clouds. But if we may give credit to ¹ *Dan: Sennertus*, it has once to his knowledge happened otherwise, *viz.* in the year 1593, when after a great storm of Thunder and Lightning, he beheld an *Iris Lunaris* adorned with all the colours of the Rain-bow. As for ours, though I could not perceive in any part of it, that it had the least shade of any colour but white; however, I thought it not unworthy our notice, not only for the infrequency of the thing (they never happening but at or near the Moons full, and then but so very seldom too, that ^m *Aristotle* professes, that he saw but two in above fifty years; and I know several learned and observing Men, that never saw such an *Iris* in their lives) but also because of the great clemency of the weather, that followed upon it at that time of the year; there falling not one drop of rain, nor any wind stirring for sixteen days after, but so great a serenity, that the waies were as clean and passable then, as we could wish or ever enjoyed them at Midsummer.

8. From the Firmament (waving all considerations of the pure *Æther*, of which we know so little, that I shall say nothing) I naturally descend to the lowest Heaven, I mean that subtile Body that immediatly incompasses the Earth, and is filled with all manner of exhalations, and from thence commonly known by the name of the *Atmosphere*. Whether beside these exhalations, there be any peculiar simple body, called Air, I leave to the more subtile Philosophers, and consider it here only, as 'tis the subject of storms, of thunder and wind, of *Echo's*, and as it has relation to sickness and health.

9. As to Tempests that have happen'd in this County, though perhaps there have been some heretofore attended with as deplorable effects as any where else; yet because they are no where transmitted to posterity, I shall only mention two within our memory, *viz.* The storm of wind that happen'd one night in February, Anno 166¹₂, which though general (at least all over

¹ *Sennertus in Epitom. Phys.* ^m *Et videtur de Meteor. lib. 3. cap. 2.*

England) yet was remarkable at *Oxon*: in these two respects. 1. That though it forced the stones inwards into the cavity of *All-hallows* Spire, yet it over-threw it not. And 2^{ly} That in the morning, when there was some abatement of its fury, it was yet so violent, that it laved water out of the River *Cherwell*, and cast it quite over the Bridge at *Magdalen* College, above the surface of the River near 20 foot high; which passage, with advantage of holding by the College walls, I had then the curiosity to go see my self, which otherwise, perhaps, I should have as hardly credited as some other persons now may do. But those that have failed to the *Indies* can inform them what force *Hurricane's* and *Turbo's* have, with what violence and impetuosity they take up whole Seas of water, and furiously mount them into the airⁿ. Now that such as these may also happen at Land (though perhaps for the most part of less strength) I think we have little reason to doubt, since our own Chronicles inform us, that in *Q. Maries* time, within a mile of *Nottingham*, all the houses of two little Parishes, with their Churches, were wholly born down by such a Tempest; and the water, with the mud from the bottom of the River *Trent*, that ran between them, carryed a quarter of a mile and cast against Trees, with the violence whereof they were torn up by the roots.

10. Of much such another Land *Hurricane*, *Bellarmin* gives us a relation so incredible, that he himself premiseth, *Quod nisi vidissem non crederem. Vidi* (saies he) *à vehementissimo vento effossam ingentem terræ molem, eamque delatam super pagum quendam, ut fovea altissima conspiceretur unde eruta fuerat, & pagus totus coopertus & quasi sepultus manserit, ad quem terra illa divenerat*^o. Which being sufficient (I suppose) to evince the possibility of my story, I proceed to

11. The second tempest of Thunder and Lightning, on the 10th of May, 1666. which though terrible enough to all parts adjacent to *Oxford*, yet was mischievous only at *Medley*, a well known House, about a mile or somewhat more distant from it; two Scholars of *Wadham* College, alone in a boat, and new thrust off shore to come homewards, being struck off the head of the boat into the water, the one of them stark dead, and the other

ⁿ It was observed by an able Sea-man of Bristol, that this wind was the sag-end of a Hurricane, which began in New-England about three hours before it came hither; the Sea-men observ'd that it went directly towards England. ^o *Bellarmin. de ascens. ment. in Deum, Grad. 2. cap. 4.*

stuck fast in the mud like a post, with his feet downward, and for the present so disturbed in his senses, that he neither knew how he came out of the boat, nor could remember either Thunder or Lightning that did effect it. Others, in another boat about ten or twenty yards distance from the former, felt a disturbance and shaking in their boat, and one of them had his chair struck from under him, without hurt. But of this no more, a full relation of the accident being already given by the Reverend and Learned D^r *John Wallis Savilian* Professor of Geometry in the University of *Oxford*, and publish'd in our English Philosophical Transactions^P.

12. What hapned before or after those Tempests, I was not so curious in those days to observe, but it might indeed be wish'd, as the learned and observing D^r *Beale* advises^q, that some old Almanacks were written instead of new; that instead of the conjectures of the weather to come, some ingenious and fit Persons would give a faithful account from divers parts of the world, not only of the Storms, with the antecedents and consequents of them, but of the whole weather of the years past, on every day of the month; as it was industriously begun above 300 years ago, by *William Merle* Fellow of *Merton* College, who observed the weather at *Oxford* for every day of the month for 7 years together; viz. from *January Anno Dom. 1337*, to *January Anno Dom. 1344*. the MS copy of which Observations yet remain in the *Bodleyan Library*^r; For from hence in time we might examine upon some grounds, as the learned D^r *Beale* well remarks, how far the positions of Planets, or other symptoms or concomitants, are indicative of weathers, and probably be forewarn'd of Dearth, Famines, Epidemical Diseases, &c. and by their causes be instructed for remedies, or prevention. Certainly from such Calendars we might learn more in few years, than by Observations at random all the days of our lives; and if they might be had from foreign and remote parts^{*}, we should then be in some hopes of true Investigations of heats and colds, and of the breadth and bounds of coasting Rains and Winds.

13. Next the Tragedies (it being as agreeable to my Method, as seasonable to the Discourse) it will not be amiss to present the

^P *Philosoph. Transact. Numb. 13.* ^q *Philosoph. Transact. Num 90.* ^r *MS. Digby, fol. 176.* ^{*} Such observations of the weather every day of the month through the whole year 1671, were made by *Erasmus Bartholine*, and are printed inter *Acta Medica Tho. Bartholini* Obf. 130.

Reader with some of the sports of Nature, and entertain him a-while with the Nymph *Echo*; a Mistress she is indeed that is easily spoke with, yet known to few: if therefore I take pains to acquaint him with her, I hope I shall not perform a thankless office.

14. First therefore, that *Philebus* may not be out in his choice, whenever he attempts to court her in *Oxford-shire*, he must know that of these there are several sorts, and may best, I suppose, be distinguish'd by their Objects, which are,

| | | | |
|--------|------------|---|---|
| either | are either | { | <i>Single</i> , such as return the voice but once; and these again |
| | | | <i>Poly syllabical</i> , such as return many syllables, words, or a whole sentence. |
| either | are either | { | <i>Tonical</i> , such as return the voice but once, nor that neither, except adorned with some peculiar Musical note. |

Manifold, and these return syllables and words, the same oftentimes repeated, and may therefore be stiled *Tautological Echo's*, which are caused

either by { *Simple* } Reflexion.
 { *Double* }

15. As for *Poly syllabical articulate Echo's*, the strongest and best I have met with here, is in the Park at *Woodstock*, which in the day time, little wind being stirring, returns very distinctly seventeen syllables, and in the night twenty: I made experiment of it with these words,

—*Quæ nec reticere loquenti,*
Nec prior ipsa loqui didicit resonabilis Echo.

In the day it would return only the last verse, but in the night about twelve by the clock, I could also hear the last word of the former *Hemistick* [*loquenti.*] The object of which *Echo*, or the *Centrum phonocampticum*, I take to be the hill with the trees on the summit of it, about half a mile distant from *Woodstock* town, in the way thence to the Right Honorable the Earl of *Rochester's* Lodge: And the true place of the Speaker, or *Centrum phonicum*, the

the opposite Hill just without the gate at the Towns end, about thirty paces directly below the corner of a wall inclosing some hay-ricks, near *Chaucers* house: some advantage I guess it receives from the rivulet that runs as it were in a direct line between the two centers, and from the pond at the foot of the object hill; as also from two other hills that run obliquely up to it: Which may better be apprehended by the prospect of the place, as in *Tab. 1. Fig. 2.*

16. That this *Echo* makes return of so many syllables, and of a different number in the day and night, being indisputable and matter of fact; I proceed in the next place to the reasons of these certainties, which possibly to every body may not be so plain. First then, the causes why some *Echo's* return more, and some fewer syllables, I take to lye in the different distances of the objects (returning the voices) from the places of the speakers: for by experience 'tis found, that if the speaker be too near the object, the return is made so quick upon him, that the *Echo* is as it were drowned in the voice: but if he remove farther from it, then it begins to be clear and distinct; and if it be a *polysyllabical* one, it first repeats one syllable, then two, three, four, five, or more, according as the speaker removes farther off it, which I take to be the only true way of measuring the proportions of the spaces of the ground, requisite for the return of one or more syllables. That this is true, I shall use no arguments to persuade, because the experiment is subject to every man's tryal; and if so, it must necessarily be admitted, that the reason why this *Echo* returns so much, is because of the great distance of the object from the speaker.

17. What distance is required to the return of each syllable, is best indeed determined by such a procedure, where the object is fore-known, and the condition of the place will admit of the experiment: but both these being wanting here (*Echo's* themselves being generally first known, and not the objects) I was forced to make use of a new *analytical* method, and find out the object by the number of syllables already returned, which being seventeen in the day time, and twenty by night; and having before found by frequent experience, that according to *Blancanus*^s, no one syllable will be returned clearly, under the distance of 24

^s *Blancani Echometria Theorem 5.*

Geometrical paces, or 120 feet, I guess'd that the object could not be removed less than 400 of the former, and 2000 of the latter. For the better understanding of which *Analysis*, and for the Readers more secure finding of the true distance of the speaker in any other place, it may be convenient that he take notice, that all *Echo's* have some one place whither they are returned stronger, and more distinct than any other, and is always the place that lies at right angles with the object, and is not too near, or too far off: for if a man stand at oblique angles with it, the voice is better returned to some other person at another place, than to the speaker; and so if he stand too near, or far off, although he do stand at right angles with it, which is plain by the *diagram, Tab. 1. Fig. 3.* where

a. is the true place of the speaker.

a b. the vocal line falling at right angles on the object.

c d. places on each hand the true place, and oblique to the object.

e f. places above and below the object, whence also the voice comes obliquely to it.

g h. places whence ('tis true) the voice goes in right angles to the object, but g is too far off, and h too near.

Now the speaker standing in *a*, and his voice going in the straight line *a b*, and striking upon the object so as to make right angles with it, must needs return to the speaker again in the same line, and no farther, because he is suppos'd to stand at the two extremes of the whole mix'd line of action: but if he stand too near at *b*, then the *Echo* repeats more syllables, and distincter at *g* than either at *b* or *a*, because *g* is now the extremum of the line of action; for by how much the nearer the speaker is to the object, by so much the more forcible he strikes it, which causes the rebound to be so much beyond him: and thus if he stand as much too far off, as at *g*, then the *Echo* repeats more syllables and distincter at *b*, than either at *a* or *g*, because the distance being too great from *g* to *b*, and the reflexion weak, the *Echo* must needs terminate so much the shorter at *b*; all these being supposed to take up the whole line of the voices direct and reflex action. Again, if the speaker stand in *c* obliquely to the object, the *Echo* is better heard at *d*, than either at *a* or *c*; and so if he stand at *d*, it is better heard at *c* than any other place: thus if he stand at *e*

above the object, the *Echo* is best heard in the valley *f*, & *vice versa*. All which, may be well enough made out by throwing a ball against a wall, to which, if it be thrown in an oblique line, it returns not to the thrower but to another place; and though the projicient do so throw it, that it strikes at right angles with the wall, yet (like as in the voice) if he stand too far off, it will fall as much too short in the rebound, as it will exceed if he stand too near.

18. According to these grounds I carefully examined this *Echo*, and found, upon motion backward, forward, and to each hand, the true *centrum phonicum*, or place of the speaker, to be upon the hill at *Woodstock* towns end, about thirty paces below the corner of the wall aforesaid, directly down toward the *Kings Majesties* Manor: from whence by measure to the brow of the hill, on which my Lord *Rocheesters* Lodge stands, are 456 Geometrical paces, or 2280 feet; which upon allowance of 24 Geometrical paces, or 120 feet to each syllable, to my great satisfaction I found to be agreeable to the return of 19 syllables, *viz.* one fewer than it returns in the night, and two more than in the day.

19. The measure I must confess had been much more easie and natural, could I have began from the object, and so removed backward accordingly as the *Echo* gradually increased in the repetition of more syllables; for then I could have given the due proportion to each, if I had found any inequality upon the increase, which I guess there may be, because the allowance of an equality seems to set the object too far off by a syllable or two. But it not being feasible in this place, I was forced to take the former course; for in the valley between the two hills, being the whole *medium* through which the voice passes, and the *Echo* returns it, there is scarce any such thing as an *Echo* to be found; nay, if you stand at the Manor it self, which is not far from the true place of the speaker, and situate almost as high, and direct your voice toward the place of the object, you shall not have the least return; whence 'tis most evident that I could not use that procedure here, and therefore must desire to be held excused from giving the proportions of space, which I suppose, according to *Kircher*^r may decrease, according as the number of syl-

lables increase, till I meet with an *Echo* fit for the purpose.

20. The reason of the difference between day and night, why it should return seventeen syllables in the one, and twenty in the other, may lie, I suppose, in the various qualities, and constitution of the *medium* in different seasons; the Air being much more quiet, and stock'd with exhalations in the night than day, which something retarding the quick motion of the voice to the object, and its return to the speaker somewhat more, (by reason the voice must needs be weakned in the reflexion) must necessarily give space for the return of more syllables.

21. Amongst other tryals of this *Echo*, I discharged a Pistol, which made a return much quicker then my voice, and (at which I still wonder) with a much different sound from that the Pistol made, whence I can only conclude, that the more forcibly the Air is stricken, (as also in the projection of a ball) the sooner the response is made, and that possibly there may be some sounds more agreeable to every *Echo*, than others. And it being my Lord *Bacon's* opinion, That there are some letters that an *Echo* will hardly express, and particularly the letter S, which, saies he, being of an interior and hissing sound, the *Echo* at *Pont Charenton* would not return^u; hereupon I tryed, as well as his Lordship, with the word *Satan*, beside many others of the same initial, but found the *Echo* here neither so modest or frightened, but that, though the Devil has been busie enough hereabout (as shall further be shewn near the end of this History) it would readily enough make use of his name.

22. Just such another *poly syllabical Echo* we have at *Magdalen College*; in the water-walks, near the Bull-work called *Dover Peer*; it repeats a whole *Hexameter* verse, but not so strongly as *Woodstock*: Where the true object of this may be, cannot so well be found by measure, because of the many Buildings interposing; but I conjecture it may be about the publick Schools, or *New College* *. I could gladly, I confess, have assigned it something further off, because I fear that distance falls somewhat short of our former account, but the buildings beyond lying all lower then those, it must by no means be admitted; which makes me think, there must be a latitude allowed in these matters, according to the

^u *Nat. Hist. Cent. 3. Numb. 251.* * Since, *New College* hath been advanced a Story higher, A. D. 1675. this *Echo* is somewhat alter'd.

different circumstances perhaps of time, as well as place; and that possibly *Mersennus* might not be so much mistaken, when he assigned to each syllable but 69 feet.

23. *Tonical Echo's*, such as return but some one particular Musical Note, I have met with several, and do not doubt but they are to be met with in most arched Buildings, though scarce observed or noted by any. Such a one is that in the Gate-house at *Brasen-nose College*, which answers to no Note so clearly, as to *Gamut*. The curious and well built Gate of *University College*, to none so well as *B mi*. The like Note I met with again at *Merton College*, in the Vault between the old and new Quadrangles, and in the large arched Vault of *Queens College* Gate: Whereas the stately arched Stair-case leading into *Christ Church* great Hall, will return all the Notes through the Scale of Musick. These I must confess are but *Echo's* improperly so called, because they will express nothing that's articulate, and therefore rather fall under the notation of a *Bombus*; yet their cause being somewhat nice and subtile, I thought not fit to pass them by, but to take occasion from hence to advertise the Reader, that there are some other inanimate Bodies beside the *Load-stone*, that though they have no sense, yet have a sort of perception, which I take to be sufficiently proved from these Vaults, that seem to have a kind of election to embrace what is agreeable, and exclude all that is ingrate to them: thus are the very seats in Churches and Chappels affected with some peculiar Notes of the *Organ*; and I have a friend (a Violist) whom I dare believe, that says, his Thigh is thus sensible of a peculiar Note, as oft as he lights on it during his playing. Some have imputed much of this in Buildings, to the figure and accurate structure of the Arch, and that where they have different shapes and magnitudes, there will be different tunings also: But I do not find it agreeable to experience, there being another Vault in the entrance into *Merton College* Chappel, much less, and of a far different figure from that other before mentioned in the same *College*, which returns very near, if not exactly the same Note: And so do the Gates of *Queens* and *University Colleges*, than which in height, breadth and length, there are few more different.

24. It must therefore rather be referr'd to the pores of the stones, which are fitted to receive some vibrations of the Air,
rather

rather than others ; just as in two Viols tuned to a *Unison*, where the strings being screwed to the same tension, and their pores put into the same figure, if you strike one, the corresponding string of the other Viol presently answers it : because the first string being of such a tension, and having pores of such a form, makes vibrations in the Air, suitable only to the pores made by the same tension in the other string.

25. As for *Tautological Polyphonous Echo's*, such as return a word or more, often repeated from divers objects by simple reflection, there are none here eminent ; the best I have met with is at *Ewelme*, on the side of a bank, in a Meddow south and by west (about a furlong) from the *Church* : it returns the same word three times, from three several objects of divers distances, which I guess may be, 1. The *Manor*, 2. The *Church* and *Hospital*, And 3^d. Colonel *Martins* house. Another there is near *Oxford*, about the east-end of *Christ Church* new walk, that repeats three or four syllables twice over ; and a treble one at the most northern point of the Fortifications in *New Parks* : But there being many better than these of the kind no doubt in other places, I shall reserve their consideration at large to a better opportunity, and only take notice here by the way, that these are never of many syllables ; and that always, by how many more they are of, by so many the fewer times they repeat them, because so great distance will be required for their objects, that they must quickly be removed out of the reflex action of the voice : for suppose but a sentence of ten syllables, viz. *Gemitu nemus omne remugit*, and allow, as before, for the return of each syllable 120 feet, the first object must be 1200 feet off ; and the second, with abatement for distance, at least 2000 ; and the third, certainly out of the voices reach, beyond all hopes of any response. Indeed, could we meet with one of *Mersennus's* *Echo's*, where sixty nine feet would return us a syllable, then such an *Hemistick* might be resounded three times, or perhaps a whole *Hexameter* twice ; yet however small a space may be found for the clear repetition of such a Verse, I cannot think it can possibly be, that any *Echo* should repeat one eight times over : for suppose a smaller distance would suffice, then that allowed by *Mersennus*, as but 350 yards to a Verse of seventeen syllables, and allowing some decrease for the objects distances ; yet I do not doubt, but two or
three

three of the furthest must needs be out of the voices action.

26. Much less sure can any single object perform this, and yet *Jacobus Boissardus*, in his *Topography* of *Rome*, reports this to be true upon his own knowledge. *On the Appian way* (saies he) *amongst many other vast ruins, which some think to have been the Castle wherein the Prætorian Soldiers lay, there are many Sepulchers, obtuse and solid Pyramids, &c. But the most eminent is of a round form, made of squared white Marble, like a Tower, hollow within and open at the top, erected in memory of Cæcilia Metella: it stands in the corner of another wall, in whose circuit there are carved in Marble, near 200 Bulls heads, whence 'tis called, Capo di Boi. At the foot of the hill where this Tower stands, if any man pronounce an Heroic Verse, a wonderful Echo there is, that returns it often entirely and articulately: I my self, says he, have heard it repeat the first Verse of Virgils Æneids distinctly eight times, and afterward often broken and confusedly. No place in the World yields the like Echo**, &c. And what if I add, nor that neither, since beside the natural impossibility of the thing, the industrious *Kircher*, after he had used all imaginable care in the quest of it, came away unsuccessful, and found no such matter*.

27. But though we have no considerable *Tautological Echo's*, by a simple reflection, yet we have others of no inferior account made by a double one, which also arising from divers objects, though in a different manner, belong to this place. Of these, though there are scarce any that will return a *Trissyllable*, occasioned, I suppose, by the nearness of the secondary objects, yet a clap with the hands or stamp of the feet, there are some will return eight, nine, or ten times, the noise dying, as it were, and melting away by degrees with such a trembling noise, that I sometime thought of the Epithet [*tremulous*] to discriminate this sort of *Echo* from the rest.

28. At *Heddington*, in the Garden of one Mr *Pawling Mercer* of *Oxon*: there is a wall of about 40 yards long, built for the advantage of the Fruit, with divers *Niches*; to which, if you stand but a little obliquely, so as to see the *Peers* standing out between each two of them, you have the several objects of such an *Echo*, not above nine or ten foot distant from each other, which return a clap with the hand, or a *monosyllable* (the wind being

* *Jani Jacob. Boissardi, Topographia Romæ, p. 65, 66.* * *Magiæ Phonocamptricæ, Prælus. 2.*

quiet and still) at least nine, if not ten or eleven times, but so thick and close, that even a *diffyllable* breeds a confusion: Where by the way if it be objected, that (the whole wall being but 40 yards, or 120 foot long) according to the afore-limited distance for *Echo's*, a *monosyllable* should not be returned above once at most: It is to be noted, that these *Echo's* made by a double reflection, begin (quite contrary to all others) at the remotest object from the *corpus sonorum*, which in as many as I have yet seen, is a distinct wall, falling on that; on which the rest of the objects are, in right angles; and this object it is, that first terminates the voice, clap, or stamp; and from which, by reflection, they next strike the *ultimate* secondary object, then the *penultimate* and *antepenultimate*; which, though nearer to the *corpus sonorum* in respect of the situation of the objects, yet are still further off in respect of the voice, or other sounds motion: whence it comes to pass, that the nearest object to the *corpus sonorum* is last stricken, and therefore repeats a syllable as well as any of the rest, because indeed in that respect the furthest from it.

29. After the voice or clap has stricken these secondary objects, by way of accession as it were to the *corpus sonorum*, it is carried again by a second reflection away from it toward the primary object, and sometimes over it, as it appears to be in this *Echo* at *Heddington*, where the sound seems as it were somewhat refracted, for it is heard quite out of the place, as is evident to any one that stands in the *North-east* corner of the Garden and speaks *Westwards*, who will hear the *Echo* rather in the Hortyard on the other side the wall, than in the Garden, which I take most certainly to be occasioned by this second reflection; for let any one that suspects the *Echo* to be really in the Hortyard, and not in the Garden, go but into it, and he shall there find no such matter as an *Echo*. All which, is more sensibly explained in *Tab. 1. Fig. 4.* where

a. is the place of the speaker or maker of any other sound.

b. the primary object first terminating the sound, and reflecting it on the Peers of the other wall.

c c c c c. the Peers between every two Niches that receive the sound reflected from the primary object and make the *Echo*.

d d d d d. the lines wherein the voice is carried back again over the primary object, whereby the *Echo* appears out of its place.

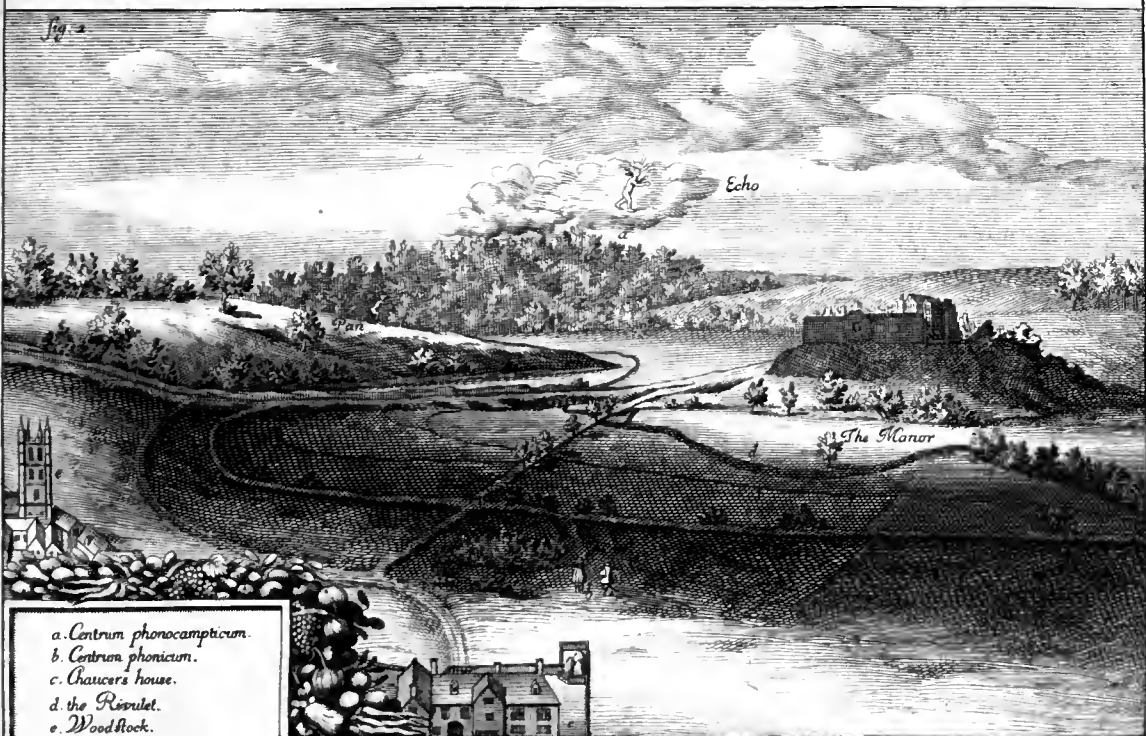
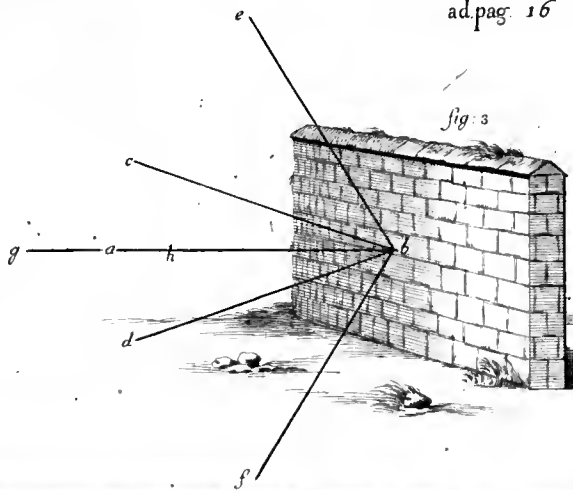
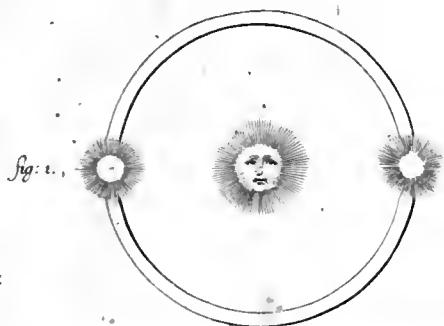
But

But herein let it be noted, that I am not so sanguine as to exclude all fears that it may be otherwise, but only suggest what seems most probable at present, *cum animo revocandi*, whenever I shall be better informed by another, or my own future experience.

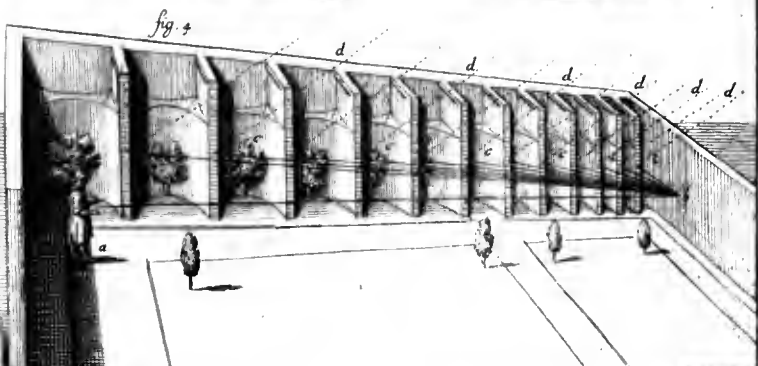
30. At *New College* in the Cloysters, there are others of this kind, to be heard indeed on all sides, but best on the *South* and *West*, because on those there are no doors either to interrupt or waſt the ſound : Theſe return a ſtamp or voice, ſeven, eight, or nine times, which ſo plainly is occaſion'd by the *Peers* between the windows, that on the *West* and ſhorter ſide (being but 38 yards long) the returns are more quick and thicker by much than on the *South*, where the primary object being above fifty yards removed from the *corpus ſonorum*, and the ſecondary ones proportionably further ; the returns are much ſlower and more diſtinct, in ſo much that on that ſide the *Echo* will return a *diſſyllable*, whereas on the *West* ſide you can have but a *monosyllable* only. If it be objected, that according to the rule, 38 yards are not enough for the return of a *monosyllable* ; I answer, that though it may be likely enough that the return of the primary object on that ſide is not heard, yet that there is none of the ſecondary ones, or *Peers* between the windows, but what are diſtant from the ſpeaker above 40 yards, and therefore may well return a *monosyllable*. And if again it be objected, that the *interval* of an *Echo* muſt be *liberum* and *patens* *, and it be further demanded how it comes about that we have ſuch *Echo's* in Cloyſters, when we can have none in wells that are cover'd with houſes, becauſe the *interval* is cloſed at both ends, as this Cloyſter is : It muſt be answered, that that rule holds only in narrow *intervals* cloſed up on all ſides, and not in ſuch Cloyſters that are open and arched to the top ; Which may alſo be the reaſon why at *Magdalen College*, where the Cloyſters are covered with a flat roof, they have but an inconfiderable *Echo*, and at *Corpus Chriſti* none at all ; notwithstanding they have all other conditions requiſite.

31. In the Cloyſter at *All-ſouls College*, in the *North* and *West* ſides, where no doors hinder, there is much ſuch another, which to the ſtamp of ones foot, or clap with the hands, answers four or five times, with a noiſe not unlike the ſhaking of a door, and in nothing differing from the former, but that to the voice it

* *Blaucani Echometria, Theoremate, 4.*



M. Dugherz sculp.



makes no response * : and indeed, it would be matter of wonder if it should, since no one side of that Cloyster comes near the distance assigned for the return of a syllable, whereas that at *Heddington* just equals it, and one side of *New College* much exceeds it.

32. Other *Echo's* there be that belong to this place, as *Echo's* upon *Echo's*, and such as my Lord *Verulam*^y styles *back-Echo's*; of which, because I have met with none considerable, I am content to pass them by, having sufficiently, as I suppose, by this time tired the Readers patience with too tedious a consideration of so particular a subject, and make haste to treat of the *Air* of *Oxford-shire*, as it stands in reference to Sickness or Health. But all *Air* of it self being equally pure, and only accidentally good or bad, accordingly as more or less filled with wholsom or noxious vapors ascending from the Waters, or moist Earths; I refer its consideration to the next *Chapter*, to which it seems more intimately and originally to belong: it being the opinion of *Hippocrates*, and on all hands agreed, That *Waters* are of much more concernment in reference to health than the *Air* can be, because they are as it were part of our aliment, and the *Air* not so; and may be of themselves fundamentally bad, whereas the *Air* is only so by participation.

* There is much such another as this, in the *Ball-Court* at *Corpus Christi Coll.* y *Nat. Hist. Cent. 3.* Num. 249, 250.

C H A P. II.

Of the Waters.

TH A T *Oxford-shire* is the best water'd County in *England*, though I dare not with too much confidence assert, yet am induced to believe there are few better ; since beside the five more considerable Rivers of *Thame*, *Isis*, *Cherwell*, *Even-lode*, and *Windrush*, there are numbred no less than threescore and ten at least of an inferior rank, beside smaller Brooks not worthy notice : And all these of so quick a stream, and free from stagnation, so clear, and yet so well impregnated with wholsom primogenial Steams of *Salts* and *Sulphurs*, that few (if any) vappid and stinking Exhalations can ascend from them to corrupt the *Air*. As for standing Pools, Marish, or Boggy grounds, the parents (at least occasions) of *Agues*, *Coughs*, *Catarhs*, they are fewest here of any place to be found : the Soyl for the most part lying dry, and water'd only with clear and rapid Fountains. In short, so altogether agreeable is this County to *Cardans* ² rule, *Solum siccum cum aquis currentibus salubritatem Aeris efficiunt*, that had he wanted an instance for confirmation, he might have found one here most suitable to his purpose. And if plenty of wholsom Fish, spontaneous productions of odoriferous Plants, and the scarcity of filthy *Reptils*, be cogent Arguments of the goodness of *Waters*, Soyls, and consequently of *Air*, as heretofore they have been accounted, I know not the place can make better pretences, as shall be shewn more at large in their proper places.

2. Beside its clearness from pestiferous vapors, I take the sharpness we find this *Air* to be of, to be no small argument of its health and purity. *Aristotle*, 'tis true, thought *Air* moderately warm, but its constant return to a brisk coldness, after it has been heated either by fire, the Sun, or warm exhalations, gives us strong suspicions that 'tis naturally cold : All natural Bodies, after they have suffered violence, returning of themselves to their innate condition. To which add, that the *Air* on the tops of high Mountains, above the reach of the Clouds and other warm Exhalations, as 'tis found to be clear, so 'tis very

² *Comment. in Hippoc. de Aere, aquis, & locis.*

cold ; whence I think it may not be *illogically* concluded, That the colder the *Air*, the nearer to purity, and consequentially more healthy : Which is also very suitable to the doctrine of *Hippocrates*, who speaking concerning the healthy situation of *Cities*, says, *That such which are placed to cold winds*, ^{α ἀρῶτον μὲν τὰ ὕδατα τὰ σκληρά τε καὶ ψυχρά, ὡς ἐπὶ τῷ πλεῖστον γλυκαίνεται} ----- ^{τὰς δὲ κεφαλὰς ὑγιαίνει, καὶ σκληραίνει.} i. e. *that though their Waters are harsh and cold, yet for the most part they are sweet, and the Inhabitants healthy and brisk, sound, and free from defluxions.* And so indeed in the main I find them here, of a very chearful humor, affable, and courteous in their Department ; neither sparing, nor profuse in their Entertainments, but of a generous temper, suitable to the sweet and healthful *Air* they live in : Whereas the *Inhabitants of fenny and boggy Countries*, whose *Spirits* are clogg'd with perpetual Exhalations, are generally of a more stupid, and unpleasant conversation.

3. That the qualities of *Waters* and *Soyls*, together with the situations of places to the respective *Quarters* of the World, make them more or less healthy, according to the great ^b *Hippocrates*, there is no doubt. But to these I must beg the favor of adding, not only more swasive but more irrefragable proof ; I mean, the great age and constant health of persons that have been lately, and are now living here : *Richard Clifford*, not long since of *Bolscot* in this *County*, died at 114 years of age : *Brian Stephens*, born at *Cherlbury*, but Inhabitant of *Woodstock*, dyed last year at 103. Where also there now lives one *George Green* (but born at *Ensham*) in his hundredth year : at *Kidlington* one *M^{rs} Hill* was born, and lived there above an hundred years : and at *Oxford* there is living, beside several near it, a Woman (commonly called *Mother George*) now in her hundredth year current. The pleasant situation of which City is such, and so answerable to the great Reputation it ever had in this respect, that it must not by any means be past by in silence.

4. Seated it is on a rising Ground, in the midst of a pleasant and fruitful Valley of a large extent, at the confluence, and extended between the two Rivers of *Ifis* and *Cherwell*, with which it is encompass'd on the *East*, *West*, and *South* ; as also, with a ridge of Hills at a miles (or somewhat more) distance, in the form

^a Hippocr. ἀεὶ αἶραν, ὕδαται τέπειν. ^b Id. ibid.

of a Bow, touching more then the *East* and *West* points with the ends, so that the whole lies in form of a *Theater*: In the *Area* stands the City mounted on a small hill, adorned with so many *Towers*, *Spires* and *Pinnacles*, and the sides of the neighboring Hills so sprinkled with Trees and *Villa's*, that no place I have yet seen has equall'd the Prospect *. 'Twas the sweetness and commodiousness of the place, that (no question) first invited *the great and judicious King Alfred*, to select it for *The Muses Seat*; and the Kings of *England* ever since (especially when at any time forc'd from *London* by *War*, *Plague*, or other inconveniencies) so frequently to remove hither, not only their *Royal Courts*, but the *Houses of Parliament*, and *Courts of Judicature*: Many *Synods* and *Convocations* of the *Clergy* have been also for the same reason held here; of which, as they have promiscuously happened in order of time, take the following *Catalogue*.

A Catalogue of Parliaments, Councils, and Terms that have been held at *Oxford*.

A Parliament held at Oxford, in the time of King Ethelred, anno 1002.

A Parliament at Oxford, under King Canutus, an. 1018.

A Parliament at Oxford, under King Harold Harefoot, anno 1036.

A Conference at Oxford, under King William Rufus, an. 1088.

A Conference at Oxford, in the time of King Stephen.

A Council at Oxford, held against the Waldenses, temp. Hen. 2. an. 1160.

A Council at Oxford, under King Hen. 2. temp. Tho. Becket Archiep. Cant. an. 1166.

A general Council at Oxford, at which King Hen. 2. made his Son John King of Ireland, an. 1177.

A Parliament at Oxford, called Parliamentum magnum, temp. H. 2. an. 1185.

A Council at Oxford, temp. Rich. 1.

A Conference at Oxford, in the time of King John.

* *Ab amœnitate situs Bellositum dictum.*

A Parliament held at Oxford, temp. Hen. 3. an. 1218. which first gave occasion to the Barons Wars.

A Council at Oxford, under Steph. Langton Arch-Bishop of Canterbury, an. 1222.

A Council at Oxford, an. 1227.

A Council at Oxford, under Stephen Arch-Bishop of Canterbury, and his Suffragans, an. 1230. 14 Hen. 3.

A Council at Oxford, temp. Hen. 3. an. 1233.

A Council at Oxford, under Edmund Arch-Bishop of Cant.

A Council held at Oxford, by the Bishops, temp. Hen. 3. an. 1241.

A Term kept at Oxford, 31 Hen. 3.

A Council at Oxford, temp. Hen. 3. an. 1247.

A Council held by the Bishops at Oxford, an. 1250.

A Parliament held at Oxford, called Parliamentum insanum, 41 Hen. 3.

A Council at Oxford, an. 1258.

A Parliament at Oxford, an. 1261.

A Parliament at Oxford, an. 1264.

A Council at Oxford, under John Peckham Arch-Bishop of Canterbury, an. 1271.

A Council held at Oxford, under Robert Winchilsea Arch-Bishop of Canterbury, an. 1290.

A Parliament summon'd at Oxford, 4 Edw. 3.

A Parliament at Oxford, 19 Novemb. an. 1382.

A Parliament at Oxford, 6 Rich. 2.

A Term kept at Oxford, 11 Rich. 2.

A Term kept at Oxford, 16 Rich. 2.

A Convocation of the Clergy at Oxford, by Tho. Arundel Arch-Bishop of Canterbury, an. 1395.

A Parliament at Oxford, 1 Car. 1. 1625.

A Parliament summon'd at Oxford, temp. Car. 1. an. 1644. The Terms kept at Oxford, eodem temp. it being the Kings Headquarters in the late Civil War.

A Parliament at Oxford, 13 Car. 2. an. 1665.

The Term kept at Oxford, eodem temp. the Plague being then at London.

5. Of these there is an imperfect List in a MSS. ^c in *Corpus Christi College Library Oxon.* in which there are also mentioned three *Synods* held in *St. Maries Church*: A *Provincial Chapter* of the *Fryars Preachers*, and a *Council* held at *Oxon.* whose Votes were written by *Abraham Woodhall.* There is also a *Provincial Council* at *Oxford*, mention'd in the Catalogue set before the Decrees of *Gratian.* But these bearing no date, and in all likelihood the same with some of the afore-mentioned; I pass on to another *Parliament*, which though not at *Oxford*, yet was held in this *County*, and therefore I suppose not improper for this place. However, I shall rather venture the danger of impropriety and misplacing, then omit the taking notice of so considerable a *Meeting*, it being the first *Parliament* held in the *County*, and doubtless in *England*; called it was at *Shifford*, now a small Village in the Parish of *Bampton*, and shewing now nothing adequate to so great an *Assembly.*

6. There is a MSS. in *Sir Robert Cottons Library*, that gives an account of this *Parliament*, which, it saies, consisted of the chief of all Orders of the Kingdom, and was called at *Sifford* (now *Shifford*) in *Oxford-shire*, by King *Alfred*, where the King as Head consulted with the *Clergy, Nobles*, and others, about the maners and government of the people, where he delivered some grave admonitions concerning the same: The words of the MSS. are these,

Æt Sifford seten ðanæn manne, ƿele Biscopas, æt ƿele Boclepes, Eples ppuse, æt Cnihtes egloche. ðen ƿar Eples Elƿricor ðe laze smuth ƿire, 7 ec Alƿred Englelinc, Engle depling, on Englaend he ƿar Cyng, hem he gan lepen, 7 ƿo hi hepen mihten hu hi hepe lif leden 7 colben.

i. e. *There sate at Shifford many Thanes, many Bishops, and many learned Men, wise Earls, and awful Knights: there was Earl Elfrick very learned in the Law, and Alfred, Englands Herds-man, Englands Darling; he was King of England, he taught them that could bear him how they should live.*

7. To which perhaps may be added, the great *Council* of *Kyrtlington* held there not long after, in an. 977, at which were present King *Edward the Martyr*, and *S^t Dunstan* Arch-Bishop of *Canterbury*; and at which died *Sidemannus* Bishop of *Crediton.* This Council by *Sir Henry Spelman* ^d is taken to be the same mentioned by *Wigorniensis* held at *Kyrtlinege*, which he guesses to be

^c MSS. fol. C. p. 173. ^d H. Spelman *Council. Tom. I. An. 977. p. 493.*

now *Katlage* in *Cambridge-shire*; but I rather believe it was held here, not only for the sake of the name, which remains the same to this day, but because of the one and only Constitution made there, *viz. That it should be lawful for the Country People to go in Pilgrimage to St. Mary of Abington*; a thing in all likelihood not so desirable to the People of *Cambridge-shire*, as to ours of *Oxford-shire* so near the place: Beside, the great reputation that this place was of in ancient times, seems to justify my plea, it enjoying as great Privileges, and perhaps being a fitter place in those days for the reception of such an Assembly, then *Oxford* it self; for I find it part of the Possessions of the Kings of *England*, from whom it came to *Henry*, Son of *Edmund Crouchback* Earl of *Lancaster*, and Father to *Henry*, the first Duke of *Lancaster*, by whose Daughter and sole Heir *Blanch*, it came to *John* of *Gaunt* Duke of *Aquitane* and *Lancaster*, and was free, a *Thelonio, passagio, lastagio, pacagio, stallagio, tallagio, tollagio, cariagio, & terragio, per totum Regnum*, as I find it in an old Charter in the possession of the Right Worshipful Sir *Tho: Chamberleyne*, now Lord of the Town, whose singular civilities in imparting this, and some other matters hereafter to be mention'd, I cannot but in gratitude ever acknowledge.

8. From whence (after so long, but I hope not unpleasant digression) I return to the Beautiful *Oxford* again, a place of so sweet and wholsom an *Air*, that though it must not be compared with that of *Montpellier*, yet upon my own knowledge it has proved so advantagious to some, that it has perfectly recovered them of deep Consumptions; and particularly a worthy Friend of mine, who though he came hither sufficiently spent, yet without the help of any other *Physick*, within few *Months* felt a sensible amendment; and in fewer *Years* became of as sanguine a complexion as the rest of his friends, that had almost despaired of him.

9. Some have thought the *Small Pox* here more then ordinarily frequent, and it must indeed be confest, That we are perhaps as often, though not so severely infested as some other places; for generally here they are so favorable and kind, that be the Nurse but tolerably good, the Patient seldom miscarries. But admit the Objection be truly made, That it is more subject to the *Small Pox* than other neighboring Cities about, yet if by so much

much the less it feel the rage of the *Plague*, I think the edge of the charge is sufficiently rebated. 'Tis reported amongst the ^c observations of an ingenious Person that resided long in the Island *Japan*, That though the Air be very salubrious there, yet the *Small Pox* and *Fluxes* are very frequent, but the *Plague* not so much as ever heard of; which has often made me reflect on the year 1665, when the *Pestilence* was spread in a maner all over the Kingdom, that even then, though the Court, both Houses of Parliament, and the Term were kept at *Oxford*, the *Plague* notwithstanding was not there at all.

10. Others again, tell us of the *Black Affise* held in the Castle here, *an.* 1577. when a *poysonous steam* broke forth of the Earth, and so mortally seised the spirits of the *Judges, Sheriffs, Justices, Gentry* and *Juries*, beside great numbers of others that attended the business, that they sickned upon it and almost all of them dyed: but let it not be ascribed to ill *fumes* and *exhalations* ascending from the Earth and poysoning the Air, for such would have equally affected the *Prisoners* as *Judges*, but we find not that they dyed otherwise then by the halter, which easily perswades me to be of the mind of my ^f Lord *Verulam*, who attributes it wholly to the smell of the *Goal*, where the *Prisoners* had been long, close, and nastily kept.

11. 'Tis true, that *Oxford* was much more unhealthy heretofore then now it is, by reason the City was then much less, and the Scholars many more, who when crowded up in so narrow a space, and the then slovenly Towns-men not keeping the street clean, but killing all maner of Cattle within the walls, did render the place much more unhealthy. Hence 'tis, that we find so many rescripts of our Kings prohibiting *macellationem grossarum bestiarum infra muros, & quod vici mudentur à fimis & fimaribus*, bearing date 13 *Hen.* 3. 29 *Edw.* 1. 12 *Edw.* 3. 37 *Hen.* 6.^s and all alledging the reason, *quia per has macellationes, &c. aer ibidem inficitur*, because by the killing such maner of Cattle, and laying the dung in the streets, the Air was infected. Moreover, about these times the *Isis* and *Cherwell*, through the carelessness of the Towns-men, being filled with mud, and the Common-shoars by this means stopt, did cause the ascent of *malignant* vapors whenever there happened to be a Flood; for beside its stirring

* *Philosoph. Transact.* num. 49. † *Nat. Hist. Cent.* 10. num. 914. ‡ *MSS. in Arch. Bib. Bod.* fol. 90, 91.

the infectious mafs, great part of the waters could not timely pafs away, but ftagnating in the lower Meddows, could not but increafe the noxious putrid ftreams. But the former being long fince remedied by the care of the *Univerfity*, and the latter by the piety and charge of *Richard Fox* Bifhop of *Wincheſter*, and Founder of *C. C. C. Oxon.* who in the year 1517. cleaned the Rivers, and cut more Trenches for the waters free paſſage^h; the Town hath ever ſince continued in a healthful condition: though I cannot but believe, but were there yet more Trenches cut in ſome of the Meddows, the Air might be ſomewhat better'd ſtill, eſpecially during the Winter ſeaſon, when I fear ſometimes Floods ſtay a little too long, and that not only near *Oxford*, but in *Otmoor*; and all along the *Iſis* from *Enſham* to *North-moor*, *Shifford*, *Chimly*, and *Rotcot*, which brings me again to the general confideration of the Waters as well of the whole County as City.

12. That the healthineſs of *Waters* conſiſts in their due impregnation with *Salts* and *Sulphurs*, and their continuance ſo, in their continual motion, is indifputably evinced from the ſtinking *evaporations* of them upon any *ſtagnation*. Now that the *Rivers* here abound with theſe, will be altogether as manifeſt as that they run, if we conſider but the *Springs* they receive and *Earths* they waſh. The *Iſis*, 'tis true, till it comes to *New-bridge*, receives not (that I find) any eminently *ſalt* or *ſulphureous waters*; but there it admits the *nitrous Windruſh*, ſo well impregnated with that *abſterſive ſalt*, that no place yields *Blanketing* ſo notoriously white, as is made at *Witney*, a Mercat Town on that River, and upon this account the moſt eminent in *England* for that kind of Trade; though I am not ignorant, that ſome add another cauſe joyn'tly contributing with the afore-mentioned, to the excellency of theſe *Blankets*; of which more at large when I come to treat of *Arts*.

13. Somewhat lower, about *Caſſington*, it receives the *Evenlode*, a River whoſe Banks, eſpecially near the Fountain heads, are very well ſaturated with both the *Minerals*: witneſs the waters that riſe a little above Sir *Thomas Pennyſton's*, in the Pariſh of *Cornwell*, from a fort of Earth that may well paſs for a *Marle*; and the *briniſh Bog* near *Churchill-mill*, which though upon the ſurface of the ground ſeems to have no communication with the

^h Hiſt. & Antiq. Univerſ. Oxon. Lib. I. pag. 245.

adjoyning *Rivulet*, yet being so near, and the Glebe all thereabout being to be presumed of a like nature, it must needs lick some of the *Mineral* in its passage. About *Kingham* I was told of a *sulphureous* Earth, and that some of the *Waters* there were of such an odour; but whether true or no, I am sure on the other side the water, at a place called *Bould* in the Parish of *Idbury*, it is manifestly so; which being not far from the *River*, at least not from the *Stream* that runs by *Foscot*, and so into it, in all likelihood may impart to the *waters* hereabout no mean quantity of its more *volatile* parts. Upon the *Cherwell* we have a *salt Spring* runs immediatly into it; and perhaps the *sulphureous* Glebe of *Deddington* may somewhere reach the *River*. The Banks of the *Thame* are so well sated with some kind of *acid*, that no well-water in the whole Town of the name, will either brew, or lather with soap: But none of these give a *tincture* so high, that they can be perceived by the most exquisite palate, but only so far forth as may conduce to a due *fermentation*, and to keep them living: And yet without doubt from hence it is, that the *Thames* water at Sea, in eight months time, acquires so spirituous and active a quality, that upon opening some of the Cask, and holding the candle near the bung-hole, its steams have taken fire like Spirit of wine, and sometimes endanger'd firing the Shipⁱ. Hence 'tis also that its stench is no absolute corruption, and that after a third or fourth *fermentation*, it equals the waters of the Well in the Haven of *Brundisium**, and stinks no more; and though the Mariners are sometimes forced to drink it and hold their noses, yet upon that account they do not sicken; whereas all other *waters*, as far as has been hitherto observed, become irrecoverable upon stinking, and dangerous to drink.

14. *Cardan* in his Comment upon *Hippocrates*^k, takes the plenty and goodness of the Fish, to be a sure indication of the wholsomeness of *waters*. And our Country-man, the ingenious Dr *Browne*^{*}, speaking of the great fecundity of the River *Tibiscus*, admits it into consideration, whether its exceeding fertility may not be ascribed to the *saline Tinctures* it receives from the natural *salt Mines* it licks by the way: which opinions if approved, as rationally they may be, shew the health of our waters and the

ⁱ Philosoph. Transact. Num. 27. pag. 495. * Plin. Nat. Hist. lib. 2. cap. 103. ^k De Aere Aquis & locis super Text. 3. * General Description of Hungary, pag. 10.

reason of it too : for though we must not compare our *Iſis* with *Tibiscus* or *Brodrack* ; the one whereof is ſaid to conſiſt of *two parts of water, and one of Fiſh* ; and the other ſo replenish'd with them, that in Summer when the River is low, the People ſay, *The water ſmells of Fiſh* : yet in the year 1674. it gave ſo ample testimony of its great plenty ; that in two days appointed for the Fiſhing of M^r Major and the Bayliſſs of the City, it afforded betwixt *Swithins-Wear*, and *Woolvercot-bridge* (which I gueſs may be about three miles diſtant) *fifteen hundred* Jacks, beſide other Fiſh ; which great fecundity, as it argues the goodneſs of the *Element*, ſo 'tis no whether to be referr'd, as to its original cauſe, but to the various *Salts* upon which depend the propagation of all ſorts of *Species's* ¹ ; and as far as concerns this part of the *Animal Kingdom*, are plentifully to be found at the bottoms of ſome Rivers.

15. And I ſaid the rather at the bottoms of *Rivers*, not only becauſe Bodies from *Salts* have their ſolidity and weight^m, and therefore may well be preſumed to reſide in the loweſt places : but becauſe I find it the joynt agreement of all the *Water-men* hereabout that I have yet talk'd with, that the *congelation* of our *Rivers* is always begun at the bottom, which however ſurprizing it may ſeem to the Reader, is neither unintelligible nor yet ridiculous : for beſide matter of fact wherein they all conſent, *viz.* that they frequently meet the *Ice-meers* (for ſo they call the cakes of Ice thus coming from the bottom) in their very riſe, and ſometimes in the under-ſide including ſtones and gravel brought with them *ab imo*, it ſeems upon conſideration alſo conſonant to reaſon : for that *congelations* come from the conflux of *Salts*, before diſpers'd at large, is as plain as the vulgar experiment of freezing a pot by the fire ; and that induration and weight come alſo from thence, ſufficiently appears from the great quantities of them that are always found in ſtones, bones, *teſtaceous*, and all other weighty bodiesⁿ. Now whatever makes things compact and *ponderous*, muſt needs be indued with the ſame qualities it ſelf, and therefore affect ſuitable places ; ſo that why ſtanding Pools ſhould freeze at the top, might poſſibly have proved the greater difficulty of the two, had not the Learned D^r *Willis* already cleared the point, by ſhewing us, that all ſtanding waters are more or leſs in a ſtate of

¹ Willis, de Ferment. cap. 2. ^m Willis de Ferment. cap. 2. ⁿ Willis de Ferment. cap. 12.

putrefaction°, with their *salts* and *sulphurs* ready for flight, and in that posture catch'd by the adventitious cold, are probably so *congealed* at the top of the *water*. How consonant to truth this *Theory* may be, I leave to the Readers judgment and future experience, and by the way would have him take notice, that as this, so my other opinions hereafter to be mentioned, are not magisterially laid down, so as to juggle out better whenever they can be brought, but fairly to have their tryal, and so live or dye. But as to the matter of Fact, as I cannot but think it hard that so many people should agree in a falsity, so methinks 'tis as difficult they should mistake in their judgments, since I was told by one of the soberest of that *calling*, that he once knew a Hatchet casually fall over-board into the River near *Wallingford*, which was afterwards brought up, and found in one of these *Ice-meers*.

16. And so much for the *salts* that give life to the *waters*, multiply the *Fish*, and are the cause of *congelations*; for the watry Plants it seems have their *vegetation* from none of these, but a higher principle, which some will have to be a *volatile Niter*, brought along with the showers in their passage through the *Air*. That *subaqueous* Plants have a proportionable growth to those on the Land after a shower of rain, is also the general voice of the *Barge-men*; and herein I am the rather inclin'd to believe them, because 'tis a matter so much their interest to observe; our *water-men* here in these shallow *Rivers*, praying not so much for rain to fill them when low, as that weeds may also grow to help keep the *waters* when they have them, which will otherwise too soon glide away, to their no small detriment. Some have thought this vigorous shooting of the *aqueous* Plants, so presently sensible after plentiful showers, to proceed rather from the soyls brought with them from the hills, and impregnated with *salts* fit to promote *vegetation*; but the contrary is evident from the former *Paragraphs*, for with such as these the Rivers are daily sated, and yet this brisk *vegetation* is wanting till it rains: whence I guess that *terrestrial* and *subaqueous* Plants (that I say not such as delight in *uliginous* places) have their sprightful shooting from different principles; and if to the former I should assign a more fix'd, and to the latter a *volatile salt*, perchance I might not be much

out of the way : but it being not so much my business to find the reasons of *phænomena*, as to give the Reader such hints as may lead his greater *sagacity* to do it ; I forbear saying more, & *manum de tabula*, only advertising him, that what has been said of the *Isis* may be indifferently applyed to the rest of the greater *Rivers*, of which neither have I any thing more to add, but an unusual accident that happened to the *Cberwell*, An. 1662³, which without one drop of rain, or any other visible cause here, but from great and sudden showers that fell in *Northampton-shire*, swelled to that vast height, that in two hours time, not only the Meadows were o're-flown, *Magdalen College* cellar drowned, and their raised Water-walks cover'd ; but the River *Isis* driven back as far as *Ivy-Hincksey*, at least a mile from the confluence of the two *Rivers*.

17. But amongst the many smaller *Rivulets*, perchance it may not be unworthy notice. (1.) That the two considerable *Rivers* of *Stour* and *Ouse*, though but small here and running but little way in it, yet rise in this *County* ; the one at *Swalcliff*, which goes into the *Severn* Sea in the *west* ; and the other at *Fritwell*, whence it runs into the Sea between *Lincoln-shire* and *Norfolk* in the *east* of *England*. And (2.) that the Fountain-heads of the River *Rea* lye for the most part in a plain Country, having little more to feed them, than just a declivity to facilitate their passage ; which seems to argue, that all running *waters* owe not their continuance to rain and dews, collected as they say, on the spongy tops of hills, and sent forth again somewhere in the declivity. And so do's a small Spring at *Cleydon*, that rises in the street on the *south* side of the Town, which continues running all the year, but most plentifully like the *Scatebra* of *Pliny*^p, in the dryest weather : to which add a Well at *Ewelme*, also *south* of the Church, whose Springs run lowest in the Winter season, and advance in the Summer remarkably higher ; as I am credibly informed from *Lambourn* in *Berk-shire*, all the Springs in that Town most constantly do. But I decline all engagement in this great Controversie concerning the *origin* of Springs, till my Travels have supplied me with more, and more certain evidences, as well for the one as other part of the question.

18. That *Land-springs*, and such as run but once perhaps in many years, have their rise and continuance from plentiful show-

ers, I think we have little reason to doubt, since we have them not at all, or but very weak in any Summer, or the dryer Winters: such are those that fore-tell (and naturally enough) the scarcity and dearness of Corn and Victuals; whereof that of *Affenton*, near *Henly* upon *Thames*, is one of the most eminent that I know of in *England*; and no question is the same mentioned by *Johannes Euseb. Nierembergius* ⁹, in his Book (as he calls it) of the *Miracles of Nature*. *In Britannia territorio Chiltrensi sunt fontes multi, &c.* by which, I suppose, he must mean the *Chiltern* Country of *Oxfordshire*, *There are*, says he, *many Springs, which in fertile years are always dry; but before any defect, as the Harbingers of an approaching dearth, these waters get loose, and as it were breaking prison, they quickly unite into a forcible stream.* And so they did lately, in *An. 1674.* with that violence, that several Mills might have been driven with the Current; and had not the Town of *Henly* made some diversion for them, their *Fair Mile* must have been drowned for a considerable time. Of these there are many in the County of *Kent*, which I know not for what reason they call *Nailbourns* there, and prescribe them (some will) a certain time for their running, as once in seven, ten, or fifteen years. But the certain natural principle of such Springs, altogether depending upon an uncertain cause, no heed is to be given to such kind of stories, they being equally as vain as the persons that broach'd them.

19. Beside these constant and intermitting *Rivulets*, that always discharge themselves into Seas or Lakes, we have others here of a peculiar kind that empty themselves into neither of them; but as they first rose out of the Earth, so presently after a short stay on it, ingulf themselves again, and are no more seen. Two of these there are at *Shot-over Forest*, both rising as I take it on the *north* side of the hill; the one not far from *Heddington* Quarry-pits, is constantly fed with a double Spring, yet after it has run about two Bows shoot, is received by a *rocky subterraneous indraught*, and appears no more: for though some have thought it to come forth again at the Pool of a Mill not far from it, yet after diligent search I could find no such matter. Another there is not far from *Forest-hill*, and I think in the Grounds of Sir *Timothy Tyrrell*, which sometimes in Winter runs with that violence, and has worn its *In-let* to such a capacity, that it can and has received an *Ox*.

⁹ *De Miracul. Nat. lib. 2. c. 26.*

20. Other *waters* again are of so flow a pace, that they seem rather to sweat than run out of the Earth, part whereof being spent in *exhalation*, and the rest in satiating the dry neighboring Earth, do neither reach the Sea, are received in Lakes, nor swallowed up like the former, but of themselves are stopt upon the very surface. And yet I have observed, and believe rightly too, that these are the most durable *Land springs* we have, witness that famous one of this kind at *Nettlebed*, which I know not from what old *Witch* heretofore, by way of derision, they call *Mother Hibblemeer*; whereas if we consider how serviceable she has been, being never known to fail them in the dryest Summer, and that in a Country so incapable of Wells, that there's no such thing to be found in the Parish, she rather merits the esteem of the *Nymph* of the place.

21. In *Westphalia* they have a Spring they call their *Bolderborn*^r, from a noise that it makes at the *exit* of the water; whether ours may deserve the name, I know not, but such a one there is in the Parish of *Glympton*, in a wood about a mile *south-west* from the Church, in a place where there are stones in the form of Cockles, upon which account hereafter I shall mention it again. The *Springs*, as I remember, are in number three, and the most *southern* one of these 'tis that has the humming noise, much like that of an empty bottle held with the mouth against the wind, which perhaps may be a resemblance so befitting our purpose, that it may help to explain the cause as well as the sound: for provided the channel be large within, and the passage forth somewhat narrow like a bottle, the collision of the water against the lips of the *orifice*, may well make a noise in a large vault within, especially if the waters be indued with a spirit, as peradventure anon may be proved like enough.

22. Which is all I have to say concerning the flux of *Rivulets*, but that one there is at *Sommerton* makes a small *Cascade*, or fall of water about seven foot high; which were it not in the highway, but in a Gentlemans Garden, some use might be made on't for divers good purposes, but as the case stands I think it can have none, except for experiments of *petrifications*, for which sure it cannot but be very excellent, since the living blades of grass of not above half a years growth, within that small time

are all covered with stone, and hang down the bank like so many *Isicles*; and the Earth it self over which it glides, as 'twere foliated over with a crust of stone like the *Mosco petroso* of *Ferrante Imperato*^s. Which brings me to a closer consideration of waters, as they are eminently endued with any peculiar qualities, of *Petrification*, *Saltnefs*, or *Medicinal* use; of which in their order as briefly as may be.

23. Of *Petrifying waters*, though I doubt not but their kinds are as various, as the effects they produce; and the effects again, as the subjects they work on; yet I am inclined to believe that they all agree thus far, that they proceed in the main from the same stock and lineage, and are all more or less of the kindred of *Salts*, which sublimed and rarified in the bowels of the Earth into an invisible steam, are received by the *waters* as their most agreeable *vehicle*, and brought hither to us at the rising of *Springs*, as invisibly as the particles of silver or gold, when each is dissolved in its proper *menstruum*: where meeting perchance with an ambient *Air*, much colder and chilling than any under ground, in all likelihood are *precipitated*, and thrown down on such subjects, as they casually find at the place of their *exit*, which they presently cloath with a crust of stone; or else (where *precipitation* or *cobesion* will not suffice) they pass with the *waters* through the *pores* of the subjects, and are left behind in them just as in a *filter*.

24. The reason of which difference may probably be, that some of these *petrifying* steams or *atoms*, may be gross and more bulky than some others are, and cannot be held up in the watry *vehicle*, without such a heat as they have under ground, but fall, and by reason of their bigness, do not *penetrate*, but *adhere* to their subjects; whereas others that are fine, more minute and subtile, are easily supported in a *volatile* condition, and pass with the waters into the closest *textures*.

25. If any body doubt whether stones, and so *petrifications*, arise from *Salts*, let him but consult the *Chymists*, and ask, Whether they find not all *indurated* Bodies, such as stones, bones, shells, and the like, most highly sated with the *saline* principle? Some mixture of *Earth* and *Sulphur* 'tis true there is in them, which give the *opacity* that most stones have; from which, according as

they are more or less free, they have *proportionable transparency*, and some hardness too; as the best of gems, the *Diamant*, evinces. And if he shall ask what *Salts* are the aptest to perform this feat of *petrification*, though the difficulty of the question might well excuse me, yet I'll venture thus far to give him an answer, That I have frequently seen at *Whitstable* in *Kent*, how their *Coperas* or *Vitriol* is made out of stones that 'tis more then probable were first made out of *that*: to the Spirit of which *Vitriol* if you add Oyl of *Tartar*, they presently turn into a fix'd and somewhat hard substance, not much inferior or unlike to some *incrustations*; which seems to conclude, that from these two, all such like *concretions* are probably made; and that could we but admit that *Ocean* of *Tartar*, which *Plato*^c placed in the center of the Earth, and thought the origin of all our *Springs*, the business of *petrifications* were sufficiently clear. To which I also add in the behalf of *Vitriol*, what's matter of fact, and prevails with me much, That where-ever I find strong *Vitriol* waters, the *petrifying* ones are seldom far off; which as far as I have observed, I believe may be reduced to these three kinds that presently follow.

1. Such as purely of themselves are *petrified*, the very body of *water* being turned into stone as it drops from the rocks, which we therefore commonly call *Lapides stil-latitios*, and shall accordingly treat of them in the Chapter of *Stones*, these not strictly coming under *petrifications*, where beside the *water* and *saxeous odour*, there is always required a subject to work on of a distinct *species* from either of the two; as in

2. Such as *petrifie* by *incrustation*, and are only superficial, or

3. Such as *petrifie per minima*, or *totum per totum*; of both which I shall instantly treat, but of the last more at large in the following Chapter.

26. *Incrustations*, are *petrifications* made by such *waters* as let fall their stony particles, which because either of their own bigness, or closeness of the *pores* and *texture* of the Body on which they fall, are fixt only to the *superficial parts*, as it were, by *aggregation*, and do not enter the solid body; of which I have met with several in *Oxford-shire*, and particularly at *Sommerton*, as was above-mentioned, where the grass, being one of the *fluvia-*

^c Anton. Galatæus de fluminum generibus.

tilia, is covered over with a soft stone ; and yet so, that broken off, the grass appeared (for any thing I could see) as fresh and green as any other not *crusted*, nothing of the blade being alter'd or impaired, which is the nearest *incrustation* I ever yet saw : for though some of these *petrified* blades of grass hung down at least a foot in length, yet slipping them off from about the root, I could take the grass by the end, and pull it clean out as it were from a sheath of stone, so little of *cohesion* had the one to the other : the reason of which I guess may be, that the *pores* of the Plant possess with its own juice, and already furnish'd with a *congenial salt*, might well refuse *adventitious* ones.

27. And yet far otherwise is it, but just on the other side the River at *North-Astton*, in a Field *north-west* of the Church, where either the *petrifying* water, or plants, are so different from what before I had found them at *Sommerton*, that though there too the work be begun by *adhesion*, yet the roots of *rushes, grass, moss, &c.* are in a while so altogether eaten away, that nothing remains after the *petrification* is compleated, but the figures of those Plants with some augmentation.

28. And *petrifications* of this kind I frequently meet with, that happen on things of much different substances, as *shells, nuts, leaves of trees*, and many times on their most *ligneous* parts. In the Parish of *S^t Clements* in the Suburbs of *Oxford*, about a quarter of a mile distant, on the right hand of the first way that turns *east-ward* out of *Marston-lane*, there is a ditch, the water whereof *incrustates* the sticks that fall out of the hedge, and some other matters it meets with there : but this is so inconsiderable, that I should not have mention'd it, but that it has been taken notice of by so many before, that my silence herein would have looked like a defect. Much better for this purpose is the water of a Pump at the *Croß-Inn* near *Carfax*, in the City it self, which not only *incrustates* boards fallen into it, but inserts it self so intimately into the pores of the wood, that by degrees rotting it away, there is in the end the succession of a perfect stone ; and that not without some coarse representation of the very lineaments of the wood it self : Which though I must confess to be of somewhat a higher kind of *petrification* than *incrustation*, yet it being wholly performed by accession of parts, and continual intrusion into the open pores of rotten wood, will not amount to the warranty of a different *species*.

29. A curious pattern I have of this kind, in a piece of wood given me by M^r Pomfret School-master of *Woodstock* (whose care in my enquiries I must not forget) wherein nature has been so seasonably taken in her operation, that the method she uses is easily discovered; for being interrupted in the midst of her work, one may plainly see how the stony *atoms* have intruded themselves, as well at the *center* as *superficies*, and so equally too into all parts alike, that 'tis hard to discern in any part of it, whether stone or wood obtain the better state.

30. *Petrifications* of this kind are always *friable*, and though sometimes they faintly shew the grain, yet never, that I could see, keep the colour of the wood; in the fire they are as *incombustible* as any other stone, and lose nothing of their extension, but their colour for the most part seems to alter toward white: in distilled Vinegar they remain *indissoluble*, though not without the motion (as M^r Hooke^u well observes) that the same spirit has when it corrodes *Corals*, yielding many little bubbles, which in all probability (as he says) are nothing else but small parcels of Air driven out of its substance by that insinuating *Menstruum*, it still retaining the same extension: but in *aqua fortis*, the *Sommerton* crust was wholly dissolved into a white substance, not unlike the *white wash* used by *Plasterers*. All of them increase the bulk of the subject on which they work; and most of them, as the ingenious M^r Hooke also further notes, seem to have been nothing more but rotten wood, before the *petrification* began.

31. But some others I have seen of a far nobler kind, that shew themselves likely to be *petrifications per minima*, and performed with a steam so fine, as *permeates* the very *schematism* and *texture* of the body, that even to a *Microscope* seems most solid, and must in all likelihood be as *tenuous* as the subtlest *effluvia* that come from a *Magnet*; some whereof are so unlike rotten wood, that they keep the colour and *texture* of heart of Oak, and are some of them so hard that they cut Glass: and with one of them, that seems formerly to have been a piece of *Ground-ash*, I strook fire to light the candle whereby I write this. But I have nothing more to say of it here, because I guess the change not to have been wrought by *water*; that therefore I offer not violence to the Chapter of *Earths*, by which I think this, and all

▪ *Micograph. Obs.* 17.

other of the kind, I have met with in *Oxford-shire* have been performed; I forbear, and proceed to the other *salt waters* that are more eminently such, and do not *petrifie*.

32. And amongst *them*, we must remember to reckon all such as are unfit for *washing*, and will not take *Soap*; for though these to our taste are not sensibly *salt*, yet to our touch (as the Learned *Willis* ^w notes) they are harsh and unpleasant, which they have from their too great *impregnation* with *Salts*: But what is a much more certain evidence of it, we do not find any but instantly *lathers*, except such as hold an *acid salt*, and discover themselves such upon *evaporation*. To which may be added this very easie Experiment, That if to simple water, and such as before would *lather* well, you add some few drops of Spirit of *Vitriol*, or some such like *acid*, it presently refuses to mix with *soap*: The reason of which seems indeed to be no other, but the congress of the *acid salt* of the *water*, with the *fix'd* and *alcalizate* one of the *soap*, which it so wholly subdues to its own inclinations, that it will not permit it any longer to hold the oily parts of the *soap*, or mix them with the *water*; but now visibly increased both in quantity and weight, by the considerable *acquest* of this new prisoner, it may also perhaps so fill up the *pores* and little cells of the *water*, that the excluded *sulphur* or oily parts of the *soap* (as in their separate nature) are forced to the surface.

33. Many of these waters are every where found, and according to some, all *Pump* waters are such; but that they are mistaken, my experience has taught me, for I have met with some that will *lather* very well.

34. At *Henly* they are troubled with many of them, but not so much as they are at *Thame*; for there they have a way to let them stand two days, within which time (as I was informed by my worthy Friend M^r *Munday*, Physitian there) the *Vitriol*, or whatever other *acid* it be, falls down to the bottom of the Vessels that hold them, and then they will wash as well as one can desire. But at *Thame*, where there is never a Well in the whole Town whose water will wash, or (which is worse) brew: This Experiment, for I caused it to be tryed, will by no means succeed; so that were they not supplied by the adjoining Rivulet, the place must needs be in a deplorable condition. The reason, I

^w De Ferment. cap. 9.

suppose, why the *acid* will not fall, as it do's at *Henly* and some other places, is because these waters, beside their salt, in all probability also hold a crude *Sulphur*, whose viscous particles do so tenaciously embrace it, that it will not admit of any separation; which may also perhaps be a hint to the cause why their Beer will stink within fourteen days whenever they attempt to brew with this *water*, for where a *Sulphur* is any thing great in quantity, and its body opened and exalted by the heat in brewing, and the active spirituous particles of Mault, (as I guess the case may have itself here) the frame of that *mixture* may probably be loosed, wherein the *spirits* first taking their flight, the *Sulphur* will next begin to *evaporate*, whose steams being smartly *aculeated* by the *salt*, that then bears the chief sway in the subject, cause the stink of the Beer that is brewed with such water.

35. Other waters there are that are palatably *salt*, and sufficiently stinking without being brewed, and such is that before-mentioned near *Churchill-mill*; but I think within the bounds of the Parish of *Kingham*; The water as it stands looks of a greenish colour, as most of the palatably *salt* waters do, and to it resort all the Pigeons in the Country; which should they not do, I should much wonder, since besides its saltness it has such a stink, that it equals the *salt stone*, and *roasted dog* too: so that should the *Proprietor* but build a Dove-house here, he might honestly rob all his neighbors of their flights; but that he may not put it to so invidious a use, I shall divert him anon by a more profitable way.

36. As to the *salt* that impregnates this *water*, I do not take it to be a simple one, but some Mineral *concrete* both of *salt* and *sulphur*; for without these two be in their exaltation, and become so far fluid as to endeavor a divorce from each other, it could never acquire so noisom a smell. Which *concrete* should I call a *salt Marine*, peradventure I might not be much mistaken; for if you take but a small quantity of thrice calcined *Bay salt*, and dissolve it in a pint of Well-water, upon dissolution you will have much such an odour, as has been observed by a late Author in a short account of the *Sulphur Well* at *Knarsborough**.

37. Nor hinders it at all that the *Sea* is so remote, since whether *springs* have any communication with it or no, such *marine salts* may be had very well; for if the *Sea* grow *salt* by the Earth

* *Simpsons Hydrolog. Chym. part. 2.*

that it licks, which I take to be as certain as that 'tis not so by *torrefaction*; then if it be possible we may have such Earths, as give the *Sea* those *salino-sulphureous* tinctures, it's altogether as possible we may have such *waters* too, without any necessity of such communication.

38. If it be objected, That the *waters* of the *Sea* send forth no such stench as we find these do, let it be considered that the flux of the one, and stagnation of the other, may well occasion such a difference; whilst the *Sea-waters* are in their motion, 'tis true their *salts* and *sulphurs* so involve one another, that their mutual imbraces hinder all *evaporations*; but whenever they come to stand but awhile, as they do most times in the holds of Ships, then their *sulphurs* evaporate with as great a stink, as can be supposed ours have here at Land; and this the Ships pump doth frequently witness, to the great content of all that travel by *Sea*, it being a sure indication of the Ships health, which abundantly recompences the inconvenience of the stench.

39. Such another I have heard of in the Parish of *Chadlington*, in the grounds of one M^r *Rawlison* there, not differing in any thing at all from the former, but only it's somewhat stronger of the *marine salt*: this I must confess I saw not my self, yet having my information from so knowing a Person, and of so unquestionable fidelity as Sir *Thomas Pennyston*, I doubt not at all the truth of the thing.

48. A *salt spring* there is also at *Clifton* near *Deddington*, within a Quoits cast of the *River* side: but its *saline* particles are so subtilized in the *water*, that they scarcely can at all be perceived by the palate, and yet it lays them down plentifully enough on the stones and Earth over which it passes. What sort of *salt* this is, I care not to determine, because it will be difficult not to mistake; for upon *evaporation* of about a gallon, it yielded a *salt* of a *urinous* tast: which at first I must confess was so surprising to me, that I could not but think, that during my absence, some waggish fellow had either put a trick on me, or else that I might have used some unfit vessel; whereupon I caused a new earthen pot to be bought, well glased, and then repeated the Experiment very carefully, but found in the end all had been honest about me, for I had a *salt* again of the very same tast.

41. How this should come about I cannot divine, unless from
the

the sweat of the Bodies of *Animals*, it being much used in *cuticular* Diseases; but this I think neither can well be, because 'tis a constantly running *spring*, and would sure carry off what might be left of that nature: I therefore wholly leave it to the *Readers* greater perspicacity, and shall content my self with this satisfaction, that however improbable the thing may seem, that in the mean time 'tis an improbable truth.

42. I have often since wish'd, that I had tryed this *water* with a solution of *Alum*, and seen whether it would have given any thing of that milky precipitation it do's with *Urines*; which being then quite out of my head, is left to the tryal of some ingenious person that lives thereabout; though before-hand I must tell him, that I believe it will not succeed because the *urinous* substance seems not to be copious enough.

43. Divers might be the uses of these *waters*, and particularly of the two first, as good, or perhaps better than that at *Clifton*, for *cuticular* Diseases of Men and Beasts; some whereof I have known carryed out of these Inland *Countrys* to the *Sea* side; whereas 'tis likely they might (in all the Distempers for which we have recourse thither) with much more ease have had a remedy at home.

44. But far more profitable must they surely be, if employed to improve poor and barren Lands, which no question might be done by casting them on it. In *Cheshire*¹, near the *Salt-pits* of *Nantwich*, 'tis yearly practised thus to *brine* their Fields; which though never done, but after the fall of great store of Rain-waters into their *pits*, which before they can work again must be gotten out, and with it some quantity of their *brine* too, yet even with these but brackish waters do they so season their adjoining Lands, that they receive a much more profitable return, then they could have done from any soil or dung.

45. In *Cornwall* and *Devonshire*, so considerable are their improvements by *sea-sand*, that it is carryed to all parts as far as they have the advantage of the water, and afterwards 10 or 12 miles up higher into the Country on horses backs: At which I must confess I marvel not at all, since we are informed by an intelligent *Gentleman* of those parts², that where-ever this sand is

¹ Sir Hugh Plat's *Jewel-house of Art and Nature*, cap. 104. ² *Philosoph. Transact. Num.* 113.

used, the seed is much and the straw little, (*I have seen*, saies he in such a Place, *good Barly, where the ear has been equal in length with the stalk it grew on*) and after the Corn is off, that the grass in such places turns to *Clover*. Some of the best of this sand, he saies, lies under *Ouse* or Mud about a foot deep; and who knows but there may be such a Sand under the briny Bog near *Church-bill-mill*, or at *Chadlington*? I am sure the *salt spring* at *Clifton* comes from a sand; if so, and the Farmers thereabout get such Corn and *Clover-grass*, I hope I shall not want the thanks of the Country.

46. However, I do not doubt but the water will be serviceable, either to cast on their Land, as at *Nantwich*, or to steep their Corn in before they sow it, to preserve it from all the inconveniencies formerly prevented by brining and liming it, and to strengthen it in its growth.

47. Sir *Hugh Plat*^a tells us, of a poor *Country-man* who passing over an arm of the *sea* with his Seed-corn in a sack, by mischance at his landing fell into the water, and so his Corn being left there till the next *Ebb*, became somewhat brackish; yet such was the necessity of the Man, that (notwithstanding he was out of all hope of any good success, yet not being able to buy any other) he sowed the same upon his plowed grounds; and in fine, when the Harvest time came about, he reaped a crop of goodly Wheat, such as in that year not any of his Neighbors had the like.

48. Now let the Owners or Farmers of these *springs* sit down and consider of what has been said, and if they shall think fit, make tryal of them, wherein, if they meet with success, I only beg of them (which I shall gladly accept as the *guerdon* of my labors) that they would be as free of it to their poor Neighbors that have lean grounds and ill penny-worths, as *God* has been to them by me his weak instrument in the discovery.

49. Having spoke of such *waters* as cure faulty grounds, and cuticular distempers by external application, it followeth, that we treat of such as are, or may be taken inwardly, and deserve the repute of *Medicinal waters*. The first, and perchance the best of these, I found at *Deddington*, a small *Mercat Town*, within the Close of one *Mr. Lane*, where not long since digging a Well,

^a *Id. loco citate.*

and passing through a blew Clay, adorned with some glittering sparks; and meeting by the way with *pyrites argenteus*, and a bed of *Belemnites*, or (as they call them) Thunder-bolts; He came within few yards to this water, of a strong *sulphureous* smell, the most like of any thing I can think of, to the water that has been used in the scouring a foul gun: in weight lighter than pure Spring-water by an $\frac{3}{4}$ js. in a quart, and yet after several tryals, I found it so highly impregnated with a *vitrioline salt* as well as *sulphur*, that two grains of the powder of *galls* would turn a gallon of water into a dusky red, inclining to purple; nor did they only so alter the *site* and position of the particles, as to give a different colour and consistence, as it happens in waters but meanly sated; but in a quarter of an hour did so condense and constipate the pores of the watery *vehicle*, that the excluded particles of the *Minerals* appeared in a separate state, curdled in the Vessel, and of so weighty a substance, that they subsided to the bottom in a dark blue colour.

50. The sediment being great in quantity, I tryed upon red hot Irons, and some other ways, to see whether the *salts* or *sulphur*, either by colour, scintillation, or odour, might not by that means betray themselves; but with small success: whereupon I betook me to *distillation*, putting about a quart into a glass *body*, to which fitting a head and clean receiver, I gave an easie heat, till there was distilled off about three or four ounces, which when poured out, I found had neither smell, tast, or any other properties, that might distinguish it from any other *spring water* distilled: for with *galls* it would make no more alteration than any other *simple common water* would. Then ordering the fire to be slackned, to see what *precipitate* it would let fall; upon *filtration* of what remained in the *body*, I procured only a pale *calx* of a gritty substance, shewing, as it dryed in the Sun, many transparent particles intermix'd: in tast it had a faint pleasant piercing, with a gentle warmth diffused on the tongue; but pouring on it *Spirit of Vitriol*, *Oyl of Tartar*, &c. I could not perceive any manifest ebullition, so as to judge whether the *salt* contained in this residence, were either of the *acid* or *lixivate* kind.

51. Wherefore to come closer to the point, and taking directions from that accurate, severe, and profound Philosopher, the Honorable Robert Boyle Esq; the glory of his Nation, and pride

of his Family; and to whose most signal Encouragement of the Design in hand, these Papers, in great part, owe their birth: I took good *Syrup of Violets*, impregnated with the tincture of the Flowers, and drop'd some of it into a glass of this water as it came from the Well; whereupon, quite contrary to my expectation, not only the *Syrup*, but the whole body of the water turned not of a red, but a brisk green colour, the Index of a *lixivate*, and not that *acid Vitriol*, which I before had concluded on from the infusion of *galls*. The *Phenomenon* at first was very surprising, till I had further weighed the cautious Expressions of that *Noble Author*^b, and found, that he restrains the Experiment of the *Syrup of Violets*, turning red with *acids*, with provision always they be distilled Liquors; and what he seems to hint in a former Experiment*, that *sulphureous salts*, (such as the *Vitriol* of this water will anon more plainly appear to be) being of a quite contrary nature, may have different effects: which may also be the reason why this *sulphureous water*, notwithstanding it most certainly possesses an *acid salt*, will yet as certainly lather with *soap*, and raise a greater *sud* than other waters commonly do; and if put into *milk*, though boiled up to the height, will not separate the more gross from the *serous* parts of it: effects so usually following upon such applications, that perhaps till now they have always been supposed, never as yet to have happened otherwise.

52. But *Experience*, that great baffle of *speculation*, assures us the contrary to be possible enough, and brings matter of fact to confute our suppositions in the very tryal of this water, wherein the great quantity of *Vitriol*, is yet so close lock'd up by the viscous particles of *Sulphur*, and thereby rendered so dull and unactive, that it cannot exert its enmity to (as Dr *Mayow*^c) or friendly embraces with (as Dr *Willis*^d) the *alcalizate salt* it finds in the *soap*; or so compress the pores of the *milk*, as thereby to cause a *precipitation*: but having as it were thus put on the nature of a *fix'd salt*, acts not upon its like, nor longer enjoys the astringent power of an *acid*.

53. And under this vizor of a *fix'd Alkali* it was, that it acted its part, and with *Syrup of Violets*, gave a green tincture; unless

^b Hist. of Colours, Exper. 20. * Ibid. Exper. 10. ^c De Thermis Bathoniensibus, sub finem. ^d De Ferment. cap. 11.

we may allow its salt to be a *volatile Alkali*, with which also that *Syrup* turns to the same colour : to admit such a thought 'tis true is very hard, yet finding but a mile off, at *Clifton* as above-mentioned, a *Spring* strangely sated with such a kind of salt ; I adventur'd to try another Experiment of the aforesaid *Honorable Author*, and according as he directs *, made a solution of *sublimate* in fair water (the only *Criterion* I yet know of, that plainly distinguishes the two *Alkali's*) to which I added this Well-water, in great, small, and the intermediate quantities : but it answer'd not at all the design of the *Experiment*, not giving the rawny, much less the white *precipitate* : Whence 'tis easie to conclude, that this also succeeds only in discriminating *Chymical salts*, as that great *Virtuoso* well observes, and not in the immediate products of Nature.

54. One thing more I could not but observe, that notwithstanding the powers of the *Vitriol* are thus restrained in reference to its acting on *soap* and *milk*, that yet it has its usual effect upon *Iron* : for the corrosion of the Pump-rod I must believe to proceed from *Vitriol*, till any one upon better grounds can convince me, that 'tis likely it may be from somewhat else ; and yet this neither do I conceive to be done, but by such steams as ascend in the Well, and are freed from the shackles of *Sulphur*, much questioning whether the Pump-rod under, or near the bottom of the water, be eaten so or no.

55. To this add, that although the *Sulphur* do's exercise such dominion over, and so closely knits up the *Vitriol*, whil't together in the *water*, yet it may and do's too, let go its hold ; and like, what is reported by *Henricus ab Heers* of his *Spadacrene*, and the *Sauvenir* by *Frambesarius*, can hardly be kept within any bounds, but expires through glasses stop'd never so close ; 'tis true, I had not the conveniency there of putting it under the *Hermetick seal*, but so easie a passage it made through a good cork cover'd over with wax, and both bound down with a double leather, that in six miles riding it lost all its virtues, not giving then any tincture with *galls*, and having but a faint putrid smell of the *Sulphur* : Whether it lost in weight or bulk, as well as *volatile Spirits*, I must acknowledge I was not then enough curious to observe ; but imagine it might, since 'tis plain from its not

* *Hist. of Colours. Exper. 40.*

tinging with *galls*, that not only the *Sulphur*, but also the *Vitrioline* particles exhale with it, and corporeally seiz on the next agreeable subject, which 'tis manifest they did on the above-mentioned Pump-rod.

56. Beside the more considerable ingredients of *Vitriol* and *Sulphur*, 'tis evident that this *water* also holds some small quantity of *Naphtha*, one of the liquid *Bitumens*, which flies not away like the two former, but after separation of the parts, made either by *precipitation* with *galls*, or insensible *evaporation*, remains swimming on the top in a thin skin, variegated as it were with the colours of the Rain-bow, much after the same maner as 'tis frequently seen upon waters standing in boggy grounds, or such places where we dig the *bituminous Earths* called *Peats*: But whether this will burn at all, or with any such bright flame exceeding that of *sulphur*, as ^f *Hen. ab Heers* affirms of such a film that covers the waters of his *Spadacrene*, if kept all night, I have left to some ingenious person thereabout, that has both more skill and leisure to try.

57. At *Banbury*, another *Mercat Town* about four miles hence, at D^r *Lanes* Physitian there, Brother to the above-named M^r *Lane* of *Deddington*, and my very good Friend; there is also another *sulphur* Well, much like the former in taste, but not altogether of so strong a smell, holding, I suppose, either much more *salt* than that, or a less tenacious *sulphur*: for here I found not the energy of the *Vitriol* so fetter'd by the vigorous particles of *sulphur*, but that it had power to make that hostile or friendly congress with the *lixiviat salt* of *soap*, and send the oily part to float at top, making no lather or mixtion with it; and also so to constipate the pores of boiled *milk*, as to separate its parts into curds and whey. The quantity of *salt* appeared upon evaporation made by the said D^r *Lane* since I was there, but how much to a quart or gallon he sent me no word. This *water* has also a *volatile* part, collected by the said Doctor, which I did not find that *Deddington water* had; upon the tongue it seems to have a little pricking, but nothing that I could perceive of a saltish tast, wherefore trying further with a convenient *Menstruum*, it at last confest it self to be *Flores sulphuris*, *precipitating* with the same ebullition, smell, and colour, that some others did I had from the shops.

^f *Hen. ab Heers Spadacrene, cap. 4.*

58. Another of these of a *sulphureous* smell that will not take soap, and turns milk, I found at *Bould* in the Parish of *Iddury*, in part of the possessions of one *M^r Loggan*, a worthy Gentleman, (whose assistance in the tryal of this water, and furtherance in my other business, I cannot without ingratitude ever forget :) which differs from the former only in this, that besides its tinging red with powder of *Galls*, with spirit of *Urin* it turns white, which (as I had observed before at *Banbury*) that would not do: whence I have ground to suspect, that over and beside the ingredients of that, here must in all likelihood be something of *Alum*; and in this opinion I am the more confirmed, since I am informed, by the Controversie between *D^r Wittie* and *M^r Sympson*, that *Vitriol* and *Alum* are sometimes found together, as in the Cliff near the *Scarborow Spaw*. And that in *Sweden* ^B there is a single stone of a yellow colour, intermixed with streaks of white, and very weighty, that affords *Sulphur*, *Vitriol*, *Alum*, and *Minium*; now that such a stone is here, though I dare not assert, yet questionless there may be something not so altogether unlike, but whenever there is occasion of digging there-about again, the stones and earth may deserve examination *.

59. I should next have proceeded to the waters impregnated with *Vitriol* only, but that I am called back to *Deddington* again by another water of a fetid odour, in stench much exceeding all before-mentioned. This I met with in a small Close behind a Barn, within a furlong or less of that at *Mr. Lanes*, having the House where the *Dutchy-Court* is kept to the East, and the *Guild* West, and belonging to *Ch. Ch. Coll.* in *Oxon*, in smell so perfectly resembling that of rotten eggs, and accordingly so strongly affecting the sense, that I could not so much as put it to my mouth without danger at least of straining to vomit. Such a one as this is mentioned by *Georgius Agricola* ^h, at the Castle of *Steurewald* in the *Bishoprick of Hildesheim*, within a mile of *Hasda*; where, says he, there is another Spring that sends forth a stink, *qualis est pulveris bombardæ exstincti*: a description so agreeable also to our *sulphur well* at *Deddington*, that as I could not at first but wonder, that two such waters should be found at places so far asunder, so strangely alike; so it gave me a hint, that these

* *Philosoph. Transact. Num. 21. Vid. Olai Wormii, Museum de eodem, cap. 9.* * At *Snowdown-hill*, in *Carnarvan-shire*, there are also such stones. *Dr. Merret's Pinax rerum Nat. p. 217.* * *Lib. De Natura eorum quæ effluunt ex terra.*

waters in all probability might receive their tinctures from the same *Minerals*, and that their difference might only lye in the distances they have from the *Mineral* bed, or more *Colanders* the one may pass through than the other. *Agricola* observes, that the water at *Steurewald* smelling like ours, much like rotten eggs, not only comes forth of a *Marble* Quarry, but that the belchings of such as drink it fasting, give also the odour of brayed *Marble*. Whether ours have either such a passage or effect, I must confess I cannot inform the Reader; my Purse not affording me to try the one, nor my Stomach the other: However, I could wish it had not been stop'd up, as I hear it is since my being there, not only for the use it might have, but that Persons better qualified than I, might have made the *Experiments*.

60. Of *Vitriolate* and *Ferrugineous* springs, there are also plenty in this County, one at *Nether-Worton*, and another at *North-Weston**, within less than a Bolts-shot of each of their Churches; both of these, beside their tinging with *galls*, let fall a sediment of a *rusty* colour; only with this difference, that *Nether-Worton* spring is much the quicker and clearer, though I doubt not the other might be very well amended, were but little charge bestowed on it.

61. At *Shipton* under *Which-wood* there is another of these, at an Inn there whose sign is the *Red-horse*, but so weakly impregnated with the *Mineral*, that it scarce tinges sensibly with the powder of *galls*, yet lays down the *rusty* sediment in as great quantities as any of the rest; and I have met with some at other places that have plentifully enough yielded *this*, which by no means could ever be brought to confess any thing of *Vitriol*, which has begotten a strong suspicion in me, that this *rusty tincture* may probably be the *effluvium* of some other Body, different from, and not of the *chalybeat* kind: for were it so, I cannot imagin but the *salt* of *Mars* must needs be discovered. However, herein I will not be positive, but propound it only as the subject of a severer research.

62. And of these I was told of a very odd one in the Parish of *Heddington*, near a place called the *Wyke* (I think) now stop'd up, that in the *winter* time would strike with *galls*, but not in the *summer*: whereof may be given this very easie reason; that

* I found another since, near Whites-Oak in the Parish of North-Leigh.

during the time of *winter*, the pores of the Earth being stopt, and the *Mineral* thereby not permitted to exhale, the *water* is then impregnated with it, and gives the *tincture*; whereas in the *summer* season it expires so much, that the depauperated *water* can shew nothing of it. That *waters* do thus alter according to the Seasons of the Year, I found also to be manifest from the *waters* of *Deddington*, which I found somtimes lighter, and at other times heavier than common *water*, and to give much different *sediments* at divers tryals with the same materials. And this I thought convenient to note, not only to excite Men to more critical Observations, but that the curious *Explorer* may not be startled, in case he find them at any time not exactly to answer.

63. In the *Park* at *Cornbury*, not far from the *Lodge*, in a pit newly digged, there rises a *spring* also of a *Vitriol* kind, colouring the mud and earth under it very black; into this pit, it being designed for a *conservatory of Fish*, they put over night some of several sorts, but found them next day in the morning all dead; which gave me good ground to suspect (having just before met with a relation of Dr. Wittiesⁱ, That *Carps* put into a *Copper Brewing-vessel* to be preserved but for one night, were all found dead in like manner in the morning) that here might be something of that nature too; and that the *Vitriol* wherewith this *water* is sated, might rather be that of *Venus* than *Mars*: And in these thoughts I was the more confirmed, when I quickly after was informed, of an odd kind of steam that rose hereabout of a suitable effect. But of this no more, leaving its further consideration to the Right Honorable and ingenious *Proprietor* of the place, and my singular good Lord, *Henry Earl of Clarendon*, a most effectual encourager of this design.

64. To these I must add another sort of *waters*, which though in taste they resemble *milk*, must yet I believe be reduced to this Head, for I find, notwithstanding their eminent sweetness, they all refuse to lather with *soap*, and therefore conclude them to hold some *Acid*: Of these we have several within the City of *Oxford*, one at a Pump over-against the *Croß Inn*, another near the Mount in *New College Garden*, and a third at the Pump at *Buckley Hall*, now the dwelling house of one Mr. *Bowman* a Book-feller, and several other places*: All which, notwithstanding their *lacteous*

ⁱ Answer to Hydrologia Chym. p. 25. * I heard of such another somewhere near *Wardington*.

tast, I guess may be impregnated with something of *Vitriol*, which though of it self it be a smart *acid*, yet its edge being rebated with a well concocted *sulphur*, turns sweet, and becomes of that more palatable gust. And herein perhaps I have not guess'd amiss, since we are informed by as eminent, as 'tis a vulgar Experiment, that the austerity that *Vitriol* gives in the mouth, is corrected by the fumes of *Tabacco* taken quickly after it; *whose sulphureous particles*, says the Learned *Willis*^k, *mixing with the saline pontic ones of the Vitriol, create such a pleasant and mellifluous tast.*

65. There are also two small and very weak *springs*, of a *laeteous* colour but no such tast, in the way from *South-stoke* leading to *Goreing*, by the River side; not many years since of great repute in those parts for *Medicinal* use, but now quite deserted; whether upon account of the ineffectual use of them, or because they are but temporary springs, *sub Judice lis est*: The people will tell you they were very soveraign, and never ceased running till some advantage was made of the *water*, and that *Providence* till then with-held them not. This *water* issues forth from a fat whitish Earth, and has always a kind of unctuous skin upon it, yet to the tast I thought it seemed dry and *stiptical*, as if it proceeded from a kind of *Lime-stone*, further within the Earth, and not to be seen.

66. But however the case may have it self there, it is not so dubious, that at a Well in *Oddington*, there is a water of the *calcarious* kind, and proceeding sure from some neighboring *Lime-stone*, which beside its dry and *restrictive* tast, more signally evidences it self, in the *providential* cure of a local Disease amongst Cattle, frequently catch'd by their grasing on *Otmoor*, and therefore by the Inhabitants thereabout commonly called by the name of the *Moor-Evil*: The Disease is a kind of flux of the belly, and corresponds (in a Man) to what we call a *Dysentery*, whereby the Cattle so spend themselves, that in little time from well and good liking, they fall in a maner to skin and bone, and so dye away unless prevented; which is certainly done by giving them dry meat, and suffering them to drink of *this water* only.

67. Beside these we have many other *waters*, not apparently (at least to sense) of any *Mineral* virtue, yet without doubt have their *tincture* from some *subterraneous* steam, of a much finer than

^k De Anima Brutorum, cap. 12. De Gustatu.

ordinary, and therefore unknown *texture*. Such are those in many places accounted so sovereign for the *Eyes*, and cure of inveterate *Ulcers*, after the ineffectual tryals of the best *Chirurgions*: These for the most part, and perhaps not undeservedly, are commonly stiled *Holy-wells*, not only for the good they have formerly done, but for that they seem to be the immediate gift of *God*, and designed for the *poor*.

68. A very eminent one of these there is in the Parish of *Sandford*, not far from *Great Tew*, which within the memory of many thereabout, hath done great cures upon putrid and fetid old sores, a long time before given over for incurable. These *waters* have with them, according to the observations of the ingenious Doctor *Beal*¹, a kind of active friction, but intermingling with their asperities such a pleasant titillation, as invites the Patient to rub on the tensive *water*, and will all along recompence the pain of searching the wound, with such speedy and indulgent degrees of sanation, as mitigates the torment with variety of pleasures.

69. And thus (as I am informed by persons of unquestionable fidelity, that have often used them for their *eyes*, and in some other cases) do the *waters* of *St. Crosses* in the Suburbs of *Oxford*, whose Well was heretofore, and in some measure yet remains, so considerable for such like purposes, that the great resort of people to it has given occasion of change to the name of the Parish, which to this very day we call now nothing but *Holy-well*.

70. But of much greater Fame was the Well of *St. Edward*, without *St. Clements* at *Oxford*, now quite stop'd up; but as 'tis remembred by some of the antientest of the Parish, was in the field about a furlong S. S. West of the Church; this at least was believed to be so effectual in curing divers distempers, and thereupon held to be of so great *sanctity*, that here they made *vows*, and brought their *alms* and *offerings*; a custom, though common enough in those days, yet always forbidden by our *Anglican Councils*^m, under the name of *wilpeorþunga* [*Wilveorþunga*] more rightly translated *Well-worship* than *Will-worship*, as is plainly made appear by the Reverend and Learned Dr. *Hammond*ⁿ, out of an old *Saxon Penitential*, and a *Saxon Homily of Bishop Lupus*; where the word *þil* is rather shewed to signifie *fontem*, than *voluntatem*. Against these *superstitions* so ordinary in those days, there are se-

¹ *Philos. Transact. Num. 57.* ^m *Canonibus sub Edgardo. Can. 60.* ⁿ *Annotat. on Epist. Coloss. c. 2. v. 23.*

veral *prohibitions* in the fore-cited *Penitential* and *Homily*. And of which kind are also divers *Injunctions* to be seen in the Office of *Lincoln*, of *Oliver Sutton*; and amongst them, one particularly against the worship of this *Well* of *St. Edward*, without *St. Clements* in *Oxford*, and *St. Laurence's Well* at *Peterburgh*, &c.

71. And so much for the *Waters*, with the *Minerals* they hold; and perhaps too much too in such like matters, may some Man say, for an unskilful *Lawyer*: However, since what has been said, has not been *magisterially* imposed, but modestly only, and timerously conjectur'd; and since I have not invaded another Mans *profession*, by so much as naming the Diseases they may probably cure, except where they have a known reputation already, I hope I may evade the imputations of rashness, or putting my fickle into another Mans Harvest.

CHAP. III.

Of the Earths.

OXFORD-SHIRE, says Mr. Cambden^o, is a fertile Country and plentiful, the Plains garnished with Corn-fields and Meddows, and the Hills beset with Woods; stored in every place not only with Corn and Fruits, but also with all kind of Game for bound and hawk, and well water'd with Rivers plentiful of Fish. Which general description of the Soil, though in the main it be true to this day, yet if we come to a more particular and close consideration of it, we shall find, that though Oxfordshire almost in every part, where the industry of the Husbandman hath any thing shewed it self, doth produce Corn of all sorts plentifully enough; yet it has much more cause to brag of its Meddows, and abundance of Pastures, wherein (as in Rivers) few Countrys may be compared, perhaps none preferr'd. And as to matter of Fruits, I think I may better assert of it what Giraldus do's of Ireland, *Pascuis tamen quam frugibus, gramine, quam grano, fecundior Comitatus*, than groundlessly to commend it over-much.

2. The Hills, 'tis true, before the late unhappy Wars, were well enough (as he says) beset with Woods, where now 'tis so scarce, that 'tis a common thing to sell it by weight, and not only at Oxford, but at many other places in the Northern parts of the shire; where if brought to Mercat, it is ordinarily sold for about one shilling the hundred, but if remote from a great Town, it may be had for seven pence: And thus it is every where but in the Chiltern Country, which remains to this day a woody Tract, and is (as I have very good ground to think) some of the western part of the great Forest *Ansæserpals*, or *Ansæserlege*, reaching, says Leland^p, from beside *Portus Limenus* in Kent, a 120 miles westward, which happily falls out to be about this place: To which had Cæsar ever arrived, he had never sure left us such an account, as we find in his Commentaries concerning our Woods: *Materia*, says he, *cujusque generis, ut in Gallia, præter Abietem & fagum^q, i. e.*

^o Britan. in Oxfordshire. ^p Lelandi Comment. in Cyg. Cant. in verbo Limenus. ^q De Bello Gallico, lib. 5. sub initium.

that there was here all manner of wood, as in France, except the Fir and Beech: of the last whereof there is such plenty in the Chiltern, that they have now there about scarce any thing else; but it lies so far from Oxford, and so near the River side, which easily conveys it to London Mercat, that 'tis scarce beneficial to the rest of the County.

3. As to the qualifications of the Soil in respect of Corn, I find them in goodness to differ much, and not only according to their several compositions (being in some places *black*, or *reddish earth*: in others a *clay* or *chalky* ground, some mixt of *earth* and *sand*, *clay* and *sand*, *gravel* and *clay*, &c.) but chiefly according to the depth of the *mould* or uppermost *coat* of the earth, and the nature of the ground next immediatly under it: for let the uppermost *mould* be never so rich, if it have not some depth, or such a ground just underneath it, as will permit *all superfluous moisture to descend*, and admit also the *hot and comfortable steams to ascend*, it will not be so *fertile* as a much leaner *soil* that enjoys these conditions.

4. Thus have I often-times seen in this County, in all appearance a very good *soil*, and such indeed as would otherwise have been really so, less *fertile* because of its shallowness, and a cold *stiff clay*, or close *free-stone* next under-neath it, than a much poorer Land of some considerable depth, and lying over a *sand* or *gravel*, through which all *superfluous moisture* might descend, and not stand, as upon *clay* or *stone*, to chill the roots and make the Corn languish.

5. Where by the way let it be noted, that I said a *cold stiff clay* or close *free-stone*; for if there be under a shallow *mould*, a *clay* that's mixed (as 'tis common in the blew ones of this County) either with *pyrites aureus*, or *brass lumps*; or the stones be of the warm *calcarious* kind, it may nevertheless be *fruitful* in Corn, because these, I suppose, do *warm* the ground, and give so much strength, that they largely recompence what was wanting in depth.

6. More possibly might have been added to this general account of *Earths*, and not a little instructive to the *Farmers* of the Country, but I found most of them froward and to slight my *Quære's*; let them therefore thank themselves if I am not so obliging: Beside, it seems a business a little beside my *design*, there-
fore

fore in haſt I proceed to a more particular Conſideration of *Earths* (as before of *Waters*) holding ſome *Spirit*, *Bitumen*, or *concrete Juice*, and as they are uſeful in *Trades*, or are otherwiſe neceſſary, convenient, or ornamental.

7. But herein I ſhall not ſhew my ſelf either ſo angry or ignorant, or ſo much either diſreſpect my ſubject, or the civilities of the *Gentry* for the ſake of the *clowns*, as not in the next place to treat of ſuch *Earths* whoſe moſt eminent uſes relate to *Huſbandry*, ſince they alſo hold ſome *concrete Juices* (whereby they become improvements of ſuch poor barren Lands) and are therefore very ſuitable to my preſent purpoſe.

8. The beſt of theſe we call commonly *Marls*, whereof, though 'twas believed there were none in *Oxford-ſhire*, yet I met with no leſs than three ſeveral ſorts, and in quantities ſufficient enough for uſe. The *Britiſh Marls* were very famous of old, whereof *Pliny*^r numbers ſeveral ſorts; and of principal note were the *Leucargillæ*, whereby, he ſays, *Britan* was greatly enriched: And of this kind, *that* I gueſs may be one, lately diſcovered by the much *Honored*, and my truly noble Friend, *Thomas Stonor* Eſq; of *Wailington-Park*, of which he already has had good experience: of colour it is *whitiſh*, a little inclining to *yellow*, not very fat, and of ſo eaſie diſſolution, that it may be laid on the ground at any time of the year, and may be as good, I ſuppoſe, for *paſture* as *arable*: this be found at a place near *Blunds-Court*, but I think within the Pariſh of *Sbiplake*, where upon another account ſinking a deep pit, amongſt other matters he met with this *Marl*.

9. Since that, there has lately been another diſcovered by that eminent *Virtuoſo* Sir *Thomas Pennyſton*, in his own Grounds in the Pariſh of *Cornwell*, about a quarter of a mile *north-weſt* of his Houſe, of a blue colour, and ſo abſterſive, that it would readily enough take ſpots out of cloaths, and gave its *owner* ſome ground to hope, that poſſibly it might be fit for the *Fullers* uſe; but he quickly, upon tryal, diſcovered an incurable fault that the Men of that Trade will never pardon: however, I take it to be ſo rich a *Marl*, that it may amply recompence the induſtry of its *Maſter*, if laid on its neighboring barren Hills; which I *advise* may be done about the beginning of Winter, that the Froſts and

^r *Plin. Nat. Hiſt. lib. 17. cap. 6, 7.*

Rain may the better separate its parts, and fit it to incorporate with that hungry Soil.

10. Which condition I suppose may not at all be required, in the manure of a light and hollow sort of *Marl*, lately found by the worshipful and industrious Improver, *George Pudsey Esq;* of *Elsfeld*: for in water it dissolves almost as soon as *Fullers earth*, and is naturally of it self so hollow and spongy, that one would think it were always in the very ferment, and may therefore be used at any fit time of year: of colour when dry, it is of a whitish gray, intermixed with sand, and very friable, and may in all probability be the very same, with the *Marga candida arenosa friabilis*, of *Hildesheim*, mention'd by *Kentmannus*^s, and out of him by *Lachmund*. Of just such another *Marl* as this, brittle and dusty when dry, but fat when wet, we are inform'd there is at *Wexford* in the Kingdom of *Ireland*, by *D^r Gerrard Boat*^t sometime Physitian there; only that *that* is blue, and *this* a whitish gray, and may therefore be fitter for Pasture than Arable. It being observed in the Counties of *Sussex* and *Kent*, where *Marls* are most plenty of any places of *England*, that the *gray* suit with Pastures, and the *blue* (such perhaps as *Sir Thomas Pennystons*) with Arable best.

11. It may therefore be expedient, that these new found *Marls* be thus agreeably tryed, and though they answer not expectation the first year, as some say they will not^u, let not their *Owners* be thus discouraged, but still continue to make frequent tryals, of divers proportions of Earth, at all seasons of the year, with all kinds of Grain upon all sorts of Soil, till they find out the most suitable and necessary circumstances, so shall they in time attain to a knowledge beyond the expectation, and perchance imitation of their Neighbors. But I forbear to instruct such *Ingenious Persons*, as the *Owners* of the above-named *Marl-pits* are: the *Orator* being accounted little less than a fool, that went about in his Speech to teach *Hannibal* to fight.

12. But beside these, we have another sort of Earth, of a fat close texture, and greenish colour, so well impregnated with some kind of *salt*, that put in the fire, it presently *decrepitates* with no

^s *Kentman. nomenclat. rer. fos. cap. 3. de Margis.* ^t *Boats Nat. Hist. of Ireland, cap. 12.* ^u *Plin. Nat. Hist. lib. 17. cap. 8.*

less noise than *salt* it self; and in *water*, after a quick and subtle solution, leaves behind it a kind of brackish taste, which I thought might proceed from a sort of *Vitriol*; and perhaps true enough, though the water would not tinge with powder of galls: it takes grease out of cloaths extreamly well, and would it but whiten, as *Fullers earth* doth, I should not doubt to pronounce it the same with the *viridis Saponaria*, found near *Beichling* in *Thuringia*, and mentioned by *Kentmannus* in his collection of *Fossils* ^w. This we have in great plenty in *Shot-over Forest*, where 'tis always met with before they come to the *Ochre*, from which it is separated but by a thin *Iron crust*, and may peradventure be as strickt a concomitant of *yellow Ochre*, as *Chrysocola* (another green Earth) is said to be of *Gold*. At present 'tis accounted of small or no value, but in recompence of the signal favors of its present *Proprietor*, the Right Worshipful Sir *Timothy Tyrrel*, who in person was pleased to shew me the *pits*, I am ready to discover a use it may have, that may possibly equal that of his *Ochre*. Which brings me next to treat of such *Earths* as are found in *Oxford-shire*, and are useful in Trades.

13. And amongst these the *Ochre* of *Shotover*, no doubt, may challenge a principal place, it being accounted the best in its kind in the world, of a yellow colour and very weighty, much used by *Painters* simply of it self, and as often mix'd with the rest of their *colours*. This by *Pliny* ^x, and the *Latines*, was anciently called *Sil*, which we have now changed for the modern word *Ochra*, taken up as some think from the colour of the *Earth*, and the Greek word *ὀχρεῖς*, *Pallidus*; or as others, and they perhaps more rightly, from the River *Ochra* that runs through *Brunswick*, whose Banks do yield great quantities of it ^y; and from whence in all likelihood we received the name, upon the arrival of the *Angles* and *Saxons* in *Britan*.

14. They dig it now at *Shotover* on the east side of the *Hill*, on the right hand of the way leading from *Oxford* to *Whately*, though questionless it may be had in many other parts of it; The *vein* dips from *East* to *West*, and lies from seven to thirty feet in depth, and between two and seven inches thick; enwrapped it is within ten folds of *Earth*, all which must be past through before they come at it; for the *Earth* is here, as at most other

^w Cap. 1. De terris. ^x Plin. Nat. Hist. lib. 33. cap. 12. ^y Enéclius de re Metal. lib. 2. cap. 20.

places, I think I may say of a *bulbous* nature, several folds of divers colours and consistencies, still including one another, not unlike the several coats of a *Tulip* root, or *Onyon*.

The 1. *next the turf, is a reddish earth.*

2. *a pale blue clay.*

3. *a yellow sand.*

4. *a white clay.*

5. *an iron stone.*

6. *a white, and sometimes a reddish Maum.*

7. *a green, fat, oily kind of clay.*

8. *a thin iron-coloured rubble.*

9. *a green clay again.*

10. *another iron rubble, almost like Smiths cinders.*

And then the *yellow Ochre*, which is of two parts.

1. The *stone Ochre*, which we may also call native, because ready for use as soon as 'tis dug: and

2. *Clay Ochre*, which because of the natural inequality in its goodness, they wash and steep two or three days in water, and then beat it with clubs on a plank into thin *broad cakes*, of an equal mixture both of good and bad; then they cut it into squares like Tiles, and put it on hurdles laid on trestles to dry, which when thoroughly done 'tis fit for the *Merchant*.

15. Where perhaps by the way it may be worthy our notice, how different either the *Ochres*, or *opinions* of men concerning them, are now, from what they formerly were: for whereas *Dioscorides* (as quoted by *Wormius*²) commends to our choice the lightest *earthy Ochre*, highly before the other of *stone*: We on the contrary, and not without reason, prefer the *stone Ochre* as far before the *clay*.

16. I was told of a *yellow Ochre* somewhere between *Ducklington* and *Witney*, that serves them thereabout for inferior uses; and met with it beside at some other places, but none so good as this at *Shotover*; that at *Garlington* being full of blue streaks, and a small parcel (that was shewn me) taken up about *Pyrton* intermixed a little too much with red; as if it were now in the transmutation (so much spoke of by *Naturalists*) by the *earth* and *sun's* heat; first into *Rubrick*, or *Ruddle*, and thence at last into *pnigitis*, or else *black chalk*.

17. Now that *Nature* indeed proceeds in this *method*, I am almost perswaded by what I have found in *Shotover-hill*; and elsewhere near it : for within two beds next under the *Ochre* (nothing but a white Sand interceding) there lies another of a much *redder hue*, which first receiving the steams of the *earth*, is now in the way of becoming a *ruddle*, and in process of time when it grows *adust*, may at last make a change into a *black chalk*; which I should not so easily have been induced to believe, but that at *Whately Towns end*, near the foot of the hill, where lately some attempts were made for *Coal*, they met with a vein of such kind of *chalk*, which perhaps long before might have been nothing but *ruddle*, and as long before that, a *yellow Ochre*. But whether *Nature* proceed thus or no; or suppose these are not (as some have thought) the several gradations of the same individual, yet however, I shall not be guilty of mis-placing, since all three belong to the *Painters Trade*.

18. To which may be added a sort of *Ceruleum*, which in *English* we may render *native blue*, because naturally produced by the steam of some *Mineral*, latent under the afore-mentioned *Marl* at *Blunds-Court*, amongst which it is found in very good plenty; but yet so thinly coating the little cavities of the *earth*, and some other bodies (of which hereafter) to which it sticks, that no quantities can be gotten for the *Painters* use, for whom it would otherwise be very fit, as upon tryal has been found by the worthy Mr *Stonor*. *Kentmannus*^b indeed tells us of a cinereous sort of *Earth* somewhere near *Padua*, that affords such a *blue*; but I guess that ours cannot be (nor perhaps is that) the immediate production of the ambient *Earth*, but rather of some *mineral* or *metal* below it; of which more at large in a fitter place.

19. Hither also may be referr'd a gritty sort of *Umbers*, found in all parts of the *County* where there are Quarries of *Stone*: a courser kind of them I met with near *Witney*, and a somewhat finer at *Bladen Quarry*; these sometimes are found in the seams of the *Rocks*, and sometimes again in the body of the *Stone*; and notwithstanding their gritty texture, yet prove useful enough to dressers of *Leather*. But yet a much finer than either of the former, has been lately taken up at *Waterperry*, in the ground, and near the House of the Right Worshipful Sir *Thomas Curson*, of so

^b *Kentman de terris, cap. 1.*

rich and beautiful a colour, that perhaps it might better have been placed among the *Ochres*, but that mix'd with Oyl, it turned darker than that they call *English*, and much more so than the *spruce-Ochre* of *Shotover Forest*.

20. Beside these, we have another *fine Earth*, of a white colour, porous and friable, insipid and without scent, dissoluble in water; and tinging it, of a milky colour, and sometimes raising a kind of ebullition in it; found frequently in the lissoms or seams of the Rocks, or sticking to the hollow roofs of them: in short, so altogether agreeable to what *Conradus Gesner*^c (and out of him *Boetius de Boot*, *Calceolarius*, *Aldrovandus*, and *Olaus Wormius*) calls *Lac Lunæ*, that I could not but think it the very same. And to put all out of doubt, I tryed the Experiment of *Daniel Major* (who wrote no less than a whole Treatise concerning it) and found according to him, that with *Lacca*, though I could get none good, it gave the skin so florid a whiteness, that I dare pronounce it a good *Cosmetick*, and upon that very score have given it place here.

21. I observed it first near the *Worcester road*, about mid-way between *Holton* and *Sir Timothy Tyrrels*, where the Stones taken up, for I know not what use, as also at some places in *Whately* field, were all in a maner covered with it. And I met with it again near *Haseley*, in the fields between that and *little Milton*, and quickly after at *long Hanborough*, upon stones provided for walling there: I enquired of the Quarry-men what it might be, whether they had made any use, or observations of it, but all I could get would amount to no more, but that it was a sign of a very good *Lime-stone*.

22. Which also it seems is its *character* amongst our Neighbors in *Ireland*, where (we are^d told) the best *Lime-stone* is of a gray colour, and if broken, has a white dust that flies away from it. But if we may believe *Olaus Wormius*, 'tis a sign also of something much better than that, who apprehends it to be nothing less than a certain effect of *Metallick vapors*: *Oritur*, (saies he, speaking of *Lac Lunæ*) *à vaporibus metallicis, qui indies subtiles vebunt exhalationes, quæ ubi per saxa in cavitates exsudaverint, humido evocato, quod siccum est remanet & in medullam hanc raram, teneram, & friabilem concrefcit.*^e To which *Daniel Major* not only agrees, but

^c *De figuris Lapidum*, cap. 6. ^d *Boats Nat. Hist. of Irel* c. 20. sect. 4. ^e *Ol. Wormii Musæum*, cap. 4.

more particularly adds, that the matter of this Earth proceeds from the *metallick vapours* of *silver ore*, by some fermentation raised and sublimed, and then condensed on the sides of the Rocks.

23. Of which, says *Gesner*^f, there are two sorts; the one *groß* and *gritty*, because immature and crude; the other more perfectly concocted, *whiter*, *lighter*, and *softer*: And of both these we also find here, but whether indicative of *silver ore*, as in the mentioned places by *Johan: Daniel Major*^g, is the great question. In answer whereunto I cannot but add, that though I should be very unwilling, that any *Owner*, *Farmer*, or *others*, should hazard their Fortune upon my weak judgment, without the advice of ancient and experienced *Bermen*; yet that at *Shot-over*, beside *Lac Lunæ*, there are other Symbols of *silver Ore*.

24. Whereof, if any heed may be given to *Pliny*, the *Ochre* before-mention'd may be accounted one: *In argenti & auri metallis nascuntur etiam optima pigmenta Sil & ceruleum*; where by *Sil* he means such yellow *Ochre*, than which, there is no place we know of in the world that has greater plenty, or of equal worth. To which we may add a sort of *Iron-stone*, which is not *Iron-ore*, found peradventure in as great quantities here, as it is upon the hills near *Schemnitz* in *Hungary*, the greatest *Mine-town* in that *Kingdom*: where it seems it is not only a sign of the *Ore*, but is also of great use in melting of it; whereof saies *Dr. Brown*, in his Journey thither, that of a liver-colour is counted best^h. Now that we have such an *Ore*, though I dare not promise, yet provided we had in the greatest plenty, the liver-colour'd *Iron-stone* (I dare say it) would not fail us.

25. But if *Lac Lunæ* alone may be a sufficient *Index*, and if we are not mistaken in the thing it self, as I verily think we cannot be, none of the places already mention'd can shew it in quantity and goodness too, equal to a Quarry in the Parish of *Cornwell*, south west and by west about a hundred yards from the Right worshipful Sir *Thomas Pennystons* house; where it is found so well concocted, and of so great purity, that the driven Snow never appeared whiter; and yet in so great quantity too, that I cannot guess the *Mineral*, or whatsoever other *metal* it be, that

^f De figuris Lapidum, cap. 2. ^g De Lacæ Lunæ dissertatio Medica. Edit. Anno 1667. ^h Account of his Travels. pag. 92.

gives so great a steam as this, can lie very deep, or be very poor : Yet I shall not presume to advise its owner, the eminent *Virtuoso* Sir *Thomas Pennyston*, any further to dig in quest of it, than according as he shall want Stone upon other occasions, to sink his Pit for the future, *perpendicular* to the *Horizon*, whereas now he takes it as it rises *in plano* : So that in time, when he is gotten through the Rock, a more certain judgment may be past on what lies under, with little charge or damage to *him* : Where if in time he finde a Treasure, I am sure the *Discoverer* will not want his reward, from so Ingenious, and every way so accomplish'd a *Person*, at least in such proportion as has alwaies been allowed by the *Societies* of the *Mines Royal*, and *Mineral Battery-works*.

26. Beside the notice it gives of *Mines*, and use it has in covering the blemishes of the *Face*, like the Earth *Quei* of *China*, mention'd by ⁱ *Kircher* ; its *Medicinal* uses are very great. For by *Georgius Agricola*, and *Fernante Imperato* ; the former whereof calls it *Stenomarga*^k, and the latter *Agaricus Mineralis*^l : it is thought to have the virtues of the *Samian* Earth, and to be very beneficial in stopping of blood, and womens diseases. *Boetius*^m holds it to be a good *narcotick*, and that it safely may be given to procure sleep. And *Gesner*ⁿ affirms it to be commonly sold by the *Apothecaries* of *Lucern*, and used by *Chirurgians* to dry gleet-ing sores ; and that given to Nurses, it increases their milk, and quickly makes their Breasts apparently swell. And upon this account it serves me as a seasonable transition to pass next to the *Earths* of *Medicinal* use.

27. Of which the most likely I have met with yet, is dug amongst the clay they use for bricks, in the Parish of *Nettlebed*, not far from the Wind-mill, of as red a colour as *Bolus Armenus*, but not like that discolouring the hands ; strongly *adhering*, if put to the tongue, but whether *provocative* of sweat or no, I have not hitherto been able to perswade a tryal. However, let it prove never so good, I'll not promise the owner any great profit, because of the humor we have of despising our own, and only admiring and esteeming those things that are far fetched and dearly bought.

28. But quite of another mind was that famous Physitian,

ⁱ *China illustrata*. ^k *De Natur. Fossil.* ^l *Dell' Hist. Natural. Lib. 5. cap. 4.* ^m *De Lapid. & Gemmis. cap. 229.* ⁿ *De Figuris Lapidum, cap. 2.*

Mr. Henry Sayer of *Magdalene College Oxon*, who commonly made use of a cinereous Earth, somewhat tending to yellow, and finely *chamletted*, that he found at the Quarries, in the *gullies* of the Rocks in the Parish of *Heddington*: with which, as I am informed by my worthy Friend Mr. *Cross* once his *Apothecary*, and still living, he did as frequently, and as well procure Sweats, as with any of the *Forreign earths* whatever.

29. To these may be added a whitish fat *earth*, formerly of some use in *external applications*, which they fetch'd, whilst the *waters* continued in request, from the orifice of the afore-mentioned *spring* at *Goreing*, and phansied it at least, to be a very good remedy for the *ach* of Corns, and some other such *mala-dies*: but as soon as the *waters* began to fail, the *earth* too (though still there remain enough) began to decline in its reputation, and is now of very little, if of any esteem.

30. There is another white *earth* of some use in this Country, which some will have also, as well as *Lac Lunæ*, to deserve the name of a *mineral Agaric*: it grows for the most part within round hollow Flints, to be had almost every where in the *Chiltern* Country, and good to stop fluxes boiled in milk; and I was told by an eminent Physitian, has been used in Consumptions with good success. The stone in which it grows they call here a *Chalk Egg*, and is the same with the *Geodes* of the ancient *Naturalists*, of which, because further in the *Chapter of Stones*, I forbear to add more concerning it here.

31. Hither also must be referred not only the *earths* that are found to be soveraign for Mans preservation, but according to the *Logical* rule of *contraries*, such as often have been his destruction too: Whereof there are some in the Parish of *North Leigh*, that send forth such sudden and deadly steams, that they kill before the *Patient* can give the least notice, of which they have had two very deplorable examples.

32. The first whereof happened in *August*, about twenty years since, when two men of the place imployed to dig a well, first sickned, and wisely withdrew from the work: whereupon it was undertaken by two others of *Woodstock*, men of greater resolution and less wisdom; who before they could do any thing considerably in it, sunk down and irrecoverably dyed in the well: which quickly being perceived by a woman above, a *Miller* hard
by

by was called to their assistance, who as unhappily as willingly descending to them, also suddenly fell down upon them, and dyed : To whom, after some deliberation taken, *another* ventures down with a roap about his middle, but he fell from the Ladder in just the same manner, and though presently drawn up by the people above, yet was scarcely recover'd in an hour or more.

33. And now again but lately, on the 20th of *August* 1674. upon a buckets falling casually into a well, on the *south* side of the *Town*, about a furlong from the former, a woman calls her neighbor, a lusty strong man, to go down by a Ladder to fetch up her bucket, who altogether unmindful of the former accident, soon granted (as it proved) her unhappy request ; for by that time he came half way down, he fell dead from the Ladder into the water : the woman amazed, calls another of her Neighbors, a lusty young man of about eight and twenty, who hastily descending to give his assistance, much about the same place also fell from the Ladder, and dyed, without giving the least sign of his change, so suddenly mortal are the damps of this *earth*.

34. Dr. Boat^o, in his *Natural History* of *Ireland*, gives account of an accident that happen'd at *Dublin*, in a well there so very like ours, that they scarcely differ in any circumstance. And we have a relation in our *Philosophical Transactions* ^P, of such kind of damps that happen'd in Coal-mines belonging to the Lord *Sinclair* in *Scotland*. Now though we must not conclude from hence, that here must therefore needs be *Coal* ; yet, conjoyned with others I know hereabout, I take it not to be so unlikely a *sign*, but that of all others I know of in the *County*, I guess this may be the most probable place.

35. For though I think those poysonous and killing steams may indeed more immediatly have their rise from a *Pyrites*, or *Coperas stone*, found here in great plenty where-ever they dig ; a piece whereof brought me by a friend from thence, upon tast, proved a *Vitriol* so strong and virulent, that presently from my mouth it so affected my stomach, that I confess for a while I was fearful of danger : yet, it being the common consent of *Naturalists*, that such *Pyrites* are nothing but the *efflorescence* of *Mine-*

rals, latent underneath them in the bowels of the earth, my conjecture thereby is not made the less valid.

36. With the *Pyrites cinereus*, or *Copercas stone*, not unlikely there may also be some mixture of *Arsenic*, which advances its malignity to that deadly strength, that no man may approach under pain of death : But that for the future, the insensible invasions of this secret enemy may for ever be avoided ; let all *workmen*, and such as upon any account whatever have occasion to dig or go down in these wells, first throw down into them a peck of good *Lime*, which flaking in the water, and fuming out at the top, will so effectually dispel all such poisonous vapors, that they may safely go down, and stay some time unhurt.

37. From these mischievous ones of *Vitriol* and *Arsenic*, I proceed to some other more innocent *salts*, before promised more fully to be handled here, with which some *earths* being peculiarly qualified, are accordingly disposed to *petrify* bodies. How all *petrifications* are performed by *salts*, and *petrifications per minima*, by their subtilest steams, I suppose has already sufficiently been shewn, as also how *waters* most probably effect them : It remains only therefore now to be proved, that *earths* as well as *waters*, do afford such steams as permeate also the most solid *texture*.

38. To which purpose I met with a curious instance in the Fields between *Clifton* and *Nuneham-Courtney*, of a stone that represents a sound piece of *Ash*, cut both parallel and transversly to the pores, and retaining the grain and colour so well and lively, that no body at sight believes it to be other than a firm and solid piece of wood ; and yet this was taken out of grounds thereabout, as far from water as one need to wish. In short, the version seems so very perfect, its subject appearing to have been very sound and free from rottenness, that either we must own such *petrifications* as this, to be truly such, and *totum per totum*, or else allow that stones may grow in grain and colour exactly like wood.

39. But that the latter of these may not so far take place (though the possibility of the thing must not be denied) as to exclude a possibility of its being sometimes otherwise ; I take leave to instance in another *petrification* made also by an *earth*, and not by *water*, that seems to carry a necessity with it, of its subjects once being solid *wood* : for beside, that it shews the close grain of *Oak*, and

and therefore by *Naturalists* called *Dryites*: it was taken up in great quantities too, and out of some of the pieces, (whereof I have one) it may be plainly seen where *twigs* have come forth, the knots still remaining where they were cut off; so that unless we fly to the *sports* of *Nature*, and allow *her* to imitate almost all things in stone, we cannot well avoid a consent, that this was sometime really *Wood*. It was casually dug up in the Parish of *Wendlebury*, in a gravelly ground not far from the Church, and is, I believe, the same Earth mentioned so good for this purpose in our *Philosophical Transactions*⁹.

40. Thus having considered the principal *Earths* used in *Husbandry*, *Painting*, *Medicine*, &c. I proceed in the next place to treat of some others, less in value, and put to inferior uses: Amongst which we may reckon the very uppermost Turf; which beside for *Bowling-greens*, and *Grass-walks* in Gardens, is here not unfrequently used by *Thatchers*, and laid on *Mud-walls*, and the *tops* of Houses, in the place and manner of those we call *Ridge-tiles*; not that it is so good as *Thatching* (though some say it better resists the winds) but because in some places Wood is so scarce, that they cannot get *spraises* to fasten on *Thatch*; or else the people so poor that they care not to buy them.

41. Also at some other places for want of *Wood*, they make use of another sort of *Turf* for fuel, not the upper *Green-sward*, but an inferior stringy *bituminous Earth*, cut out like *Bricks*, for the most part from moorish boggy grounds; in some Countries called *Peat-pits*, in others *Mosses*. The best of this Turf that I have seen in *Oxford-shire*, I met with at Mr. *Warcups* in the Parish of *North-Moor*, but dug as I was informed in *Stanton-Harcourt*, about a mile distance S. West from the Church: it lies but one spits depth within the ground, and is supposed to be at least four foot thick: They cut it in *March*, and lay the pieces called *Peats* to dry on the grass, sometimes turning them; which when reasonably well done, they then pile up like *Wheelwrights felleys*, leaving every where empty spaces between, that the Air and Wind passing through them, they at length may become dry enough for the fire. They think that the *stringy roots*, that together with the *Bitumen*, make up the *Peats*, do never flourish above the surface: if so, I am something confirmed in an opinion, that there are

many *subterraneous Plants* not noted, of which I intend a diligent enquiry. After the *Peats* are taken out, they fill up the ground again with the grassy *earth* that was first cut up. And at *Cowley*, where they also dig them, they usually leave the depth of one *spade-graft* at the bottom, as a foundation whereon they may grow again, which in the space of twenty or thirty years, 'tis observ'd they will do in the *North of England**.

42. The scarcity also of firing has induced some People to burn a sort of *black substance*, of a grain somewhat like rotten wood half burnt, but participating also of a *Mineral* nature, and therefore by Authors called *Metallophytum*, or *Lignum fossile*: put into *water*; it will not swim; and into *fire*; it consumes but slowly, and sends forth very unpleasant fumes: it is found in a Quarry called *Langford-pits*, in the Parish of *Kidlington*, not far from *Thrup*, about eighteen foot deep under the Rock, where there lies a bed about four inches thick. But at *Ducklington* I met with a much finer kind, and richer in *bitumen*; for though on the out side it looks like wood; yet broken, it shews a smooth and shining *superficies*, not unlike to *stone-pitch*, and put in the *fire*, has not near so ill a smell. This was dug, and kindly bestowed upon me by the Worshipful *William Bayly* Esq; who told me beside of an *Aluminous earth* that he somewhere also found in his ground. As for the substance, *Lignum fossile* it is thought to be originally a *cretaceous earth*, turned to what it is by *subterraneous heats*, which probably at *Kidlington* may indeed be great; because reflected by the Quarry above it, for that it was never formerly wood, notwithstanding its specious and outward likeness, is plain, from its never being found with *roots* or *boughs*, or any other signs of wood.

43. At *Marsh Balden* Heath, and *Nuneham-Courtney*, they have a sort of *earth* of ductile parts, which put in the fire scarcely cracks, and has been formerly used by *Potters*, but upon what account I know not, now neglected. There is also a Clay near *Little Milton* that might very well serve for the *Potters* use. And at *Shotover-hill* there is a *white clay*, the fourth fold of earth in the way to the *Ochre*, which during the late wars, in the siege of *Oxford*, was wholly used for making *Tobacco-pipes* there; and is

Vid. Nich. Stemonis Prodrum. * They dig pretty good Peats also near the Wyke at Heddington; and in a boggy ground East-ward of Elsfield Church. * Ol. Wormii, Museum lib. 2. cap. 6.

still in part put to that service, mixed with another they have from *Northampton-shire*. It is also of excellent use to *Statuaries*, for making *Modells*, *Gargills*, or *Anticks*; and containing a hard, but very small grit; in *polishing* Silver, it comes near to *Tripela*.

44. And so do's an *anonymous* very *white earth*, found in the seams of the Quarries at *Teynton*, which at first I concluded a *crude Alabaſter*, because I found near it a piece that was perfect: but reducing it into a very fine powder, and putting it over a quick fire, it would not boil like *Alabaſter* duſt, nor keep the colour, but turned reddiſh. Many other tryals were made with it, in *Plaſticks*, *Polishing*, *Painting*, &c. but my endeavors ſucceeded in nothing ſo well, as in *polishing* ſmaller ſilver Veſſels, that could not endure *burniſhing well*; to which it gave a more glorious brightneſs than *Tripela* would, though perhaps not ſo laſting; and not far behinde that of burniſh'd Plate.

45. And yet neither this, nor the former will poliſh *braſs*, nor any thing elſe that is not of its colour, which has lately engaged my thoughts in a *Query*, whether in all other *Metals* the rule does hold: for I find, that *ſulphur* gives a luſter to *Gold*; and that nothing does brighten *Copper* ſo well, as a ſort of ſtuff they call *rotten ſtone*, alſo ſomthing of its colour.

46. At *Teynton* alſo, within a ſpit of the ſurface, they dig a ſort of earth they there call *Lam*, of a whitish colour inclining to yellow; which mixt with ſand, and ſome other earth, makes the beſt *earthen floors* for ground-rooms and barns: it diſſolves as quick as *Fullers-earth*, and were it not for a fault which might poſſibly be help'd, it may ſerve their turns perhaps as well as any they uſe.

47. To theſe may be added another *whitiſſearth*, which corruptly I ſuppoſe from its colour is called *Which-earth*; mixed with ſtraw, they uſe it for ſide-walls and ceilings, and with horſedung it makes mortar for laying of ſtones: it ſeems to be a natural mixture of *lime* and *ſand*, found at *Thame*, *Waterperry*, and *Adwell*, and flakes in water (like *Gypſum*) without any heat.

48. At *Milton* near *Adderbury*, *Great Tew*, and *Stunsfield*, I met alſo with another ſort of ſpongy chalk, which though it will not flake like the former; yet at *Milton* and *Adderbury* uſed for pointing, ſeems to binde the ſtones of their walls very well: and theirs at *Great Tew* being ſomewhat finer, ſerves as well to white their
rooms

rooms within (as I saw at *Swerford*) as to point walls without: but at *Stunsfield* there was no body knew of its use.

49. Other earths there are that I find in this County, for whose names, as well as natures, I am quite at a loss; whereof there is one in *Sir Thomas Pennystons Park*, which for the strangeness of its qualities deserves the first place. Of colour it is extreemly white, of little tast, and less smell; lying in veins in a yellowish clay, like a *medulla* about the bigness of ones wrist: taken out with a knife, it falls into a fine powder, somewhat gritty, but of so very great a weight, that its double at least to any other earth of its bulk; put in the scale against *white Marble dust*, it equall'd its weight, and exceeded that of *Alabaster* by almost a fourth part: set in sand in a glass retort, and driven with a quick and strong fire, it sublimed to the sides of the glass a little, but still preserved its colour and weight, till put between two *Crucibles*, one inverted upon the other; well luted, and strongly forced in a *wind-furnace* for about two hours, it lost above the moiety of its weight: for as I well remember, of *three ounces* put in, there came not out full *one* and a *half*, and yet nothing sublimed in the top of the *Crucible*: the colour still remained as white as ever, and the bulk (as near as I could guess) the same, but now of a strong *salt* and *urinous* tast; which after solution, filtration, and evaporation, came at last, to what people as little understood, as what became of its *ponderous* ingredient.

50. We tryed it also at *Cornwell*, in *Sir Thomas Pennyston's Laboratory*, because of its weight with divers *fluxing salts*, in hopes of some kind of *metalline* substance, but all, as before, to little purpose. So that I cannot tell what to divine it should be, except the *Gur* of the *Adeptists* congealed, which they describe in their Books to be much such a thing, which for want of more time to spend in its service, I leave to the discovery of future ages.

51. In the Chalk-pits almost every where in the South-east parts of *Oxford-shire*, they finde a sort of iron-colour'd *terra lapidosa*, in the very body of the *chalk*, which I think they call *Iron-moulds*, and particularly at a place between *Brightwell* and *Berrick*, of an oval figure: how they came to be of that shape, or at all grow, in a substance of so different a nature as *chalk*, I confess to be a *problem* beyond my knowledge, as well as the

use they may probably have, which I also remit to posterity to find.

52. They have an earth about *Teynton* of a yellowish colour, adorned all over with *glittering sparks*, which unless they are particles of the *specular stone*, or English *Talc*, with the former must be reckoned amongst the unknown *earths*.

53. To which add another kind of *terra lapidosa* found about *Thame*, at the bottom of their Quarries; it is much of the colour of the *Turkish Rufina*, hollow and spongy, and full of shining grains like a sort of *Pyrites*, but of what nature or use I can nowhere find. Nor of another sort of *Clay* found at *Hampton-Gay*, holding a grit of a golden colour, much of the nature of *Pyrites aureus*, only 'tis not found like that in great pieces, which by our modern Naturalists are called *Brass lumps*.

54. And thus I had concluded the *Chapter of Earths*, but that I think it belongs to this place to mention also such accidents as attend them; and therefore must not be altogether silent of an eminent *Prospect* about a mile from *Teynton*, where from a Hill *North-east* from thence, ten *Mercat towns* in a clear day may plainly be seen. Nor of a small *Earth-quake*, that on the nineteenth of *February*, 1665. was observed at divers places near *Oxford*; as at *Blechington*, *Stanton St. Johns*, &c. But it shall suffice just to mention it, Relations (with the *concomitants*) of it, being already published: one by the Honorable *Robert Boyle Esq*; and the other by the Learned *Dr. John Wallis*.

* *Philos. Transact. Num. 10, 11.*

CHAP. IV.

Of Stones.

AS in the Chapters of *Waters* and *Earths*, I treated only of such as eminently held some *salt* or *sulphur*, and were some way or other useful to *Man*: I intend in like manner in this of *Stones* strictly to observe the same *method*, and take notice only of such as either plainly shew those *Minerals*, and supply the *necessities*; or are for the *ornament*, or *delight* of *Man-kind*.

2. How all *stones* are chiefly made out of *salts*, with a mixture of *earth* and sometimes of *sulphur*, was formerly hinted in another place. It remains only that I consider them in a more particular manner, and shew which they be, and where they are, that hold any of these principles more signally than other, which I suppose by their effects may best be discover'd.

3. In the Road from *Oxford* toward *London*, not far beyond *Tetsworth*, in a hollow way on the rising of a hill, I found a soft stone there-about called *Maume*, of a whitish colour; whose *salt* is so free from the bonds of *sulphur*, that with the frosts and rain it flakes like *lime*: perhaps half the firing used to burn away the *sulphur* in other *lime-stone*, might serve the turn here. An Experiment so very likely to be beneficial to the *Country*, that I left it with the Son of the ingenious Improver, Sir *Thomas Tipping*, as a thing not unworthy of his Fathers tryal; but whether he have at all, or but unsuccessfully made any, I have not yet had the favor to hear.

4. In the way to *Whitfield*, as I rod thither from *Tetsworth*, I found the ways mended with this kinde of *stone*, I suppose because they could get no other, for certainly otherwise there were nothing more unfit, than a stone of so loose and open a *salt*: much rather with such should they mend their Lands than Highways, that like *lime*, *marles*, and *chalk*, will flake in the Winter; which I take for so sure a mark of its *improving* quality, that I cannot but commend it to the tryal of the *Country*.

5. And for their encouragement, let me farther tell them, that at a place called *Hornton* in the North of this County, they commonly

monly use the *chippings* of the *stone* dug there in the Quarry, for *improvement* of the Land, and that not without apparent success: and yet the stone is of a much harder kind, than this at *Tetsworth* and in the way to *Whitfield*.

6. Amongst some MSS. notes of *Natural things*, I met with one of a stone at *Oriel College*, commonly called (says the Author) *The sweating stone*, at which the Birds were constantly pecking and licking; as I guess (if ever there were any such thing) for some kind of *saltness* they found come from it: I say, if ever there were any such thing, for I find it not in this *new*, nor remains there any tradition of it in the *old College*. I therefore pass it by without further notice.

7. However, in short, all stones have so much *salt* in them, that in some measure they are an *improvement* of Land, for though it be so close lock'd up with *sulphur*, that the greatest frosts and rain will not make the stones run, yet there is still such an emission of *saline* steams, that some *earths* have their whole fertility from them. Thus have I seen Fields cover'd with Flints and Pebbles, produce better Corn than where there were none, which perhaps may be a better reason than what is brought by *Pliny*^u, why the Foreign *Coloni* that came to *Syracuse* to inhabit there, and practise Husbandry; after they had cleared the ground of all the stones, could have no Corn, till they had laid them again on the very same ground from whence they had taken them but just before.

8. The like may be observed in *walls and buildings*, where several sorts of *vegetables*, yea *trees* of great bigness, will thrive and prosper remote from the *earth*, without any further nourishment, than that they have from the *fertile stones*, and *lime* they are laid with, also made out of *stones*.

9. If it be objected that *Pebbles* and *Flints* also hold a *sulphur*, as well as a *salt*, and that in all probability Corn and other Vegetables may receive their flourishing verdure, rather from the warm comfortable steams of that, than the others of *salt*, I shall not so much as contend about it, but gladly accept of the opportunity by this means to pass from *stones* holding *salt* only, to such as have also a mixture of *sulphur*.

10. And such are all that with *steel*, or any other fit body,

will strike fire, and therefore by a very fit name called *Pyrites*, under which *genus* may be reckon'd not only *Pyrites* strictly taken, but *Flints*, *Pebbles*, *Sand*, and whatever else by any quick and sudden attrition may have its parts-kindled into sparks: of which as many as I find eminent in their kind, or are fit for uses, as briefly as may be.

11. And amongst them (as I think most due) for the prerogative of its colour, I assign the first place to the *Pyrites aureus*, or golden fire-stone, whereof they find great plenty in digging of Wells about *Banbury* and *Cleydon*, and somwhere in the River at *Clifton* near *Dorchester*: Some of them are taken up in great lumps (and are therefore also called *Braß lumps*) of uncertain form, whereof I had very rich ones out of the Well of one *Boreman* of *Cleydon*. But those from *Clifton* aforesaid seem to be laminated, and some of them shot into angles like *Bristol Diamants*, and are mentioned by *Aldrovandus* ^w, which he calls, *Pyrites cum fluoribus adnascentibus*, and *cujus partes coherent tanquam lapilli angulosi*. These strike fire in great plenty, and for that reason formerly have been much used for *Carabines* and *Pistols*, whil'st *Wheel-locks* were in fashion; and are also very weighty, and perhaps hold *metal*, which, were it not for the too great proportion of *sulphur* (whence such Minerals, saith the Learned *Willis* ^x, have chiefly their concretion) that carryeth it away while it melteth in the *Crucible*, by over volatilizing it, which the *Mine-men* therefore term *the Robber*, might otherwise be procured with advantage to the owner.

12. At *Aston Rowant*, *Nettlebed*, and *Henly*, and indeed all along the *Chiltern* Country, they have another sort of *Marchasite*, within side of a golden, and without of a darkish rusty colour, and therefore at some of the afore-mentioned places called commonly *Crow-iron*: this sort, if broken and laid in the air, or any other moist place, dissolves into a *salt* that tastes like *ink*, and is no question the *Pyrites* of *Kentmannus* ^y, which for that reason he terms *atramenti parens*. And such a one is the *Pyrites* found at *North-Leigh*, brought me thence by my worthy Friend *Dr. Perrot*, which not only like the former gave the tast of *ink*, but expos'd to the *air* awhile, became cover'd with a white downy *salt* of the very same tast, which I take to be such a natural *atramentum*

^w Lib. 4. cap. 3. ^x De Ferment. cap. 9. ^y Tit. 2. cap. de Succis efflorescentibus.

album, as is said by the same *Kentmannus*, *Efflorescere è pyrite Goslariano, & Radebergensi*².

13. Next to these, in order of nature as well as dignity, comes the *silver Marchasite* under consideration, of a white glistering colour, and to be had in the bottom of the River between *Clifton* and *Burcot*: this strikes fire as well as the *golden Pyrites*, but notwithstanding it was exposed in the fittest places, yet would never, that I could perceive, send forth any *efflorescence*. Another sort of them I met with at *Deddington*, taken out of the afore-mentioned *sulphur* Well there, of as glorious a colour as the former; but several times tryed on the best Steel I could get, would never yield the least spark of fire: whence I rather concluded it to be *argentum felium*, or *Cat-silver*, but that it would not shine in the dark, or consume in the fire: However, it may pass for a *sterile nitidum*, so often mentioned by *Naturalists*, it being a glorious *nothing*, of no kind of use.

14. That *Flints, Pebbles, and Sands*, are also *Pyrites*, needs no further evidence than that they strike fire, a thing so obvious to the meanest Observer, that to spend time to prove it, would be lost time to the *Reader*; it shall suffice therefore to enumerate the several kinds of each, and chiefly to insist upon such as have uses.

15. All along the *Chiltern* Country of *Oxford-shire*, *Flints* are as plentiful as any where else; amongst them the black one, well polish'd, will supply the place of the *Lydian stone*; and at *Henly* they use them in making of Glass, of which more anon in the *Chapter of Arts*. They are found beside of divers other colours, and some of them so *transparent*, that they seem not only to imitate, but to be the very same with *Achats*. I have one, found at *Dorchester*, about an inch and half square, of a *flesh colour*; and so *transparent*, that it may well enough deserve the name of *Sardachates*. Such as this were also shewn me, by the truly Ingenious, the Right Honorable *James Lord Norreys* of *Ricot*, and found, as I think his Lordship told me, some where thereabout, and are I do not question the very same stones, that *Kentmannus*^a indeed places in his Title of *Flints*, yet calls them, *Pelluentes Sardæ colore*.

16. Of *Pebbles* there are some also *transparent*, to be had a-

^a Tit. 2. cap. Sory. & de succis efflorescent. ^a Kentman. tit. 8.

bout *Finstock* and *Nuneham-Courtney*; I found them also in the way between *New-yate* and *Ensham*, but none comparable to what was shewn me by that great *Virtuoso*, the Right Worshipful Sir *Anthony Cope* of *Hanwell*, the most eminent *Artist* and *Naturalist* while he lived, if not of *England*, most certainly of this *County*, whose House me thought seemed to be the real *New Atlantis*, which my Lord *Viscount Verulam* had only in fanſie. The *Pebble* I remember was about the breadth of ones hand, of a flat form, and yet not much less than an inch in thickness, so clear and pellucid, that no *Chryſtal* that ever I saw yet excell'd it; so that had not its *Master*, the cautious *Artist*, took care to leave on it part of its outward coat, few would have believed it had ever been a *Pebble*.

17. These *Pebbles* when *transparent*, make an excellent ingredient for the *Glaß-works*; and so do those which are *white*, though not *transparent*, called by some Authors by the name of *Quocoli*, and perhaps not much different in nature from the *Cuogolo* of *Ferrante Imperato*^b, and such are the *Pebbles* gathered at *Tesino*^c, with which they make the purest *Glaſs* at the *Moran*.

18. There are about *Goreing* and *Nuneham-Courtney*, a sort of *Pebbles* of a *blue-black* colour, that if polish'd, might supply the place of *Touch*. And about *Fawler* and *Stunsfield* are a reddish kind, very hard, and for the most part of an oval Figure, so excellent for pitching of *streets* and *stables*, and for *Painters mullars*, that none can be found more fit and durable.

19. After consideration of *Flints* and *Pebbles* apart, let us now take a view of them jointly together, for so I found them at *Caversham*, and *Greenvil*, and in the way from *Pushill* to *Stonor-house*, in clusters together of divers colours, and united into one body, by a *petrified* cement as hard as themselves, and most of them I believe capable of *politure*^{*}. But the best of all are in the Close at *Stonor*, of which there are some so large and close knit, that could the Ingenious Proprietor, *Thomas Stonor* Esq; find a way to slit and polish them without too much charge, he might make him rich *Chimney-pieces* and *Tables* of them, so far excelling *Porphyrie* and *Marble*, that perhaps they might compare with the best *Jasper* or *Achat*. For I have seen such as these found about *Hampsted*, curiously wrought into handles of

^b Delt. Hist. Nat. lib. 24. cap. 16: ^c Anon. Neri, lib. 1. cap. 2. ^{*} There is a Quarry of this South of *Wolvercot* Church, but the Cement so soft, that it will not polish.

knives by that eminent Artist Sir *Anthony Cope*; to which few *Achats* might be compared, perchance none prefer'd, either in the polish or variety of colours.

20. The Ingenious Mr. *Ray*, amongst other Observations made in his Journey through *Italy, &c.* tells us, That in the Church of the *Benedictines* at *Ravenna*, the *Monks* did shew him two *Marble pillars*, for which they said, the *Venetians* offer'd them no less than their utmost weight in Silver. But the like he says, he had seen elsewhere, at the Library at *Zurich*; and at *Verona* in our *Ladies Chappel*, in the Garden of *Seignior Horatio Guisti*: their generation at first, says he, was out of a mass of small *Flints* and *Pebbles*, united by a *cement* as hard as themselves, and capable of *politure*; which *cement*, he guesses, was separated by degrees from a *fluid* wherein the stones formerly lay: which I take to be a description so agreeable to ours, that nothing more need be said to promote their tryal.

21. Hither also must be reduced a courser sort of *Smiris*, dug up in the pits at *Whately Towns* end, of a cinereous colour, hard and rough, and striking fire as well as a *Flint*. The best sort of *Smiris* serves for several uses; but ours is fit only to cut the harder sort of stones, that the sand commonly used will not so well do; and perhaps for some other inferior uses.

22. And to these must be added the several sorts of *Sands*, which upon violent motions all strike fire, and are commonly, and sometimes promiscuously used, for *Building*, *Hour-glasses*, and cutting of Stone. But some there are of a more peculiar and considerable use, and such is that dug in the Parish of *Kingham*, which after 'tis washed and duly ordered, so perfectly resembles *Calis-sand*, that it serves and is sold for the very same: it is not found in every place, but they have signs (like *Miners*) to know where it lies; viz. a sort of stuff that looks almost like rotten wood, which if they meet with under the Turf, they seldom fail of the Sand a little deeper; which they first cleanse from rubbish, and the greater stones, by putting it through a coarse sieve, then they wash it in a trough and lay it a drying; which when sufficiently done, they separate again by a finer sieve, the courser part of it from the finer: the courser serves for wheting of *sithes*, but the finer sort for scouring *pewter*, for which purpose it seems 'tis so very excellent, that the Retailers sell it for a penny a pound,

pound, which amounts to above twenty shillings a bushel:

23. Other *sands* there are also of very good use, to give a consistency and body to *glaz*; the naturally whitest are at *Nettle-bed* and *Shot-over*, but the finest by much at *Finstock* and *Ledwell*, which when washed and cleansed, at least equal the former. The first of these has been tryed with success at the Glass-house at *Henly*: and any of the rest, perhaps, might prove as good *Tarso* as any they have from *France*, or is used in *Italy*, were they but in place where they might be tryed.

24. From *Sands*, I proceed to *Lapis arenarius*, commonly called *Free-stone*, and used in Building; of which we have as great plenty and variety in *Oxford-shire*, peradventure as in any other part of *England*. The Quarry at *Heddington*, scarce two miles from *Oxford*, supplies us continually with a good sort of *stone*, and fit for all uses but that of *fire*; in which, that of *Teynton* and *Hornton* excel it. In the Quarry it cuts very soft and easie, and is worked accordingly for all sorts of Building; very porous, and fit to imbibe lime and sand, but hardening continually as it lies to the *weather*.

25. Of it in general, there are two sorts; one that they call *Free-stone*, and the other *Rag-stone*: but these again are subdivided into several *species*, according as they are cut or put to divers uses. The *Free-stone*, if cut *cubically* into very great blocks, is then by way of eminence called nothing but *Free-stone*; but if cut into *oblong*, or other sorts of *squares*, of a lesser bulk, they then call it *Asbler*; and the fragments of these of inequilateral, multangular Figures, *Scabble-burs*. The two first are used in principal Buildings, and the last, if squared, is sometimes mixed with *Asbler* in *Range-work*, or by it self in that they call *Planten-work* in the meaner Buildings: but when not squared at all, is commonly thrown in amongst *Rag-stone* for walling; for which only, and making *lime*, that second sort is good, except it rises flat in the bed, and then 'tis worth the while to hew it for paving.

26. Of the *stone* afore-mentioned consists the gros of our Buildings; but for *Columns*, *Capitels*, *Bases*, *Window-lights*, *Door-cases*, *Cornishing*, *Mouldings*, &c. in the chieftest work they use *Burford-stone*, which is whiter and harder, and carries by much a finer *Arris*, than that at *Heddington*: but yet is not so hard as

that at *Teynton*, nor will it like that endure the fire, of which they make *Mault-kills*, and *bearts* for *Ovens*; but then they take care to *surbed* the stone, *i. e.* set it edg-ways, contrary to the posture it had in the bed, for otherwise there will be some danger of its flying.

27. Beside the fire, it endures the weather, for of this mixed with another sort dug near *Whately*, on the *Worcester* road side, as it passes betwixt *Holton* and *Sir Timothy Tyrrills*, are all the oldest *Colleges* in *Oxford* built; as *Baliol*, *Merton*, *Exeter*, *Queens*, *Canterbury* (now part of *Cb. Ch.*) *College*, *Durham* (now *Trinity*) *College*, *New College*, *Lincoln*, *All Souls*, *Magdalen*, *Brasen-nose*, and the outermost *Quadrangle* of *St. John Bapt. Coll.* yet it endures not the weather so well as *Heddington*, by reason, I suppose, of a salt it has in it, which the weather in time plainly dissolves, as may be seen by the Pinnacles of *New College Chappel*, made of this stone, and thus melted away.

28. And yet the moisture of water has no such power over it, but that they make of it *Troughs* and *Cisterns*, and now of late *Mess-fats* for *Brewing*; first hinted, 'tis true, by *Mr. Bayly* of *Ducklington*, but practised by one *Mr. Veysey* of *Teynton*, who had the first made him by one *Strong* a Mason, which it seems did answer expectation so well, that it has since obtained in many other places. Of these, that generous and courteous Gentleman, *Sir Compton Read* of *Shipton* under *Whichwood*, has one that holds about sixty five bushels, drawn home with no less than one and twenty horses; they ordinarily *mess* in it three quarters of *Mault*, but can, when at any time necessity requires, *mess* five at a time: the dimensions of which Vessel of one single stone, taken within the hollow and abating its thickness, because of its vast unusual magnitude, I thought fit to note, and give as followeth;

long, 2 yards $\frac{1}{2}$.

broad, 1 yard $\frac{1}{2}$. and $\frac{1}{2}$ an inch.

deep, 1 yard $\frac{1}{2}$.

yet much larger than this might be had from the Quarry, were there use for them, or could portage be contrived; for as I was informed by many credible witnesses, there was one single stone dug in this Quarry, containing no less than *three hundred tons*. And another in the year 1673. measured by *Mr. Veysey*, of an
hundred

hundred and three tuns, accounting sixteen foot cubic to the *tun*.

29. Other Quarries there are also of considerable use, as *Bladen*, *Little Milton*, *Barford*, and *Hornton*, whereof the last has the best Fire-stone of any in the County; some of it seems to have Iron-colour'd veins, that receive (as I have seen) a tolerable polish, and is the *stone* I mention'd before, whose *chippings* (laid on it) improve their land, by reason I suppose of the *salt* there is in it, which may also be the cause it endures *fire* so well.

30. At *Cornbury Park* there was a sort of *stone*, the Quarry whereof is now quite exhausted, that never would sweat in the moistest *weather*, of which the pavement of the *Hall* in the house there, still remains as a sufficient testimony: of this, did it rise in great blocks, might possibly have been made very good *Mill-stones*, the not sweating being a principal qualification in all *stones* whatever used for *Corn-mills*.

31. But before we take leave of materials for Building, we must not forget that the Houses are covered, for the most part in *Oxford-shire* (not with tiles) but *flat-stone*, whereof the lightest, and that which imbibes the water least, is accounted the best. And such is that which they have at *Stunsfield*, where it is dug first in thick cakes, about *Michaelmas* time, or before, to lye all the *winter* and receive the frosts, which make it cleave in the *spring* following into thinner *plates*, which otherwise it would not do so kindly. But at *Bradwell* (near the Grove) they dig a sort of *flat-stone*, naturally such, without the help of *winter*, and so strangely great, that sometimes they have them of seven foot long, and five foot over: with these they commonly make mounds for their *Closets*, and I have seen a small *bovel*, that for its whole covering has required no more than one of these *stones*: and some of them are of so hard and close a *texture*, that I have known them by *Painters* of very good skill, preferr'd before *Marble* for grinding their *colours*.

32. To *stone* used in Building they sometimes add *Lime*, which because for the most part, is here made of *stone*, must also be handled in this place; for which they count the hardest *rag-stone* best, but any will make it, says the Learned *Willis*^d, except such

^d *De Ferment. cap. 10.*

as is made up of a reddish kind of gravel: the best sign of it here, as well as in *Ireland*, has been sufficiently hinted in the former Chapter, to be that *white* and *spongy* kind of *matter*, that sticks to the *stones* in the caverns of the *Rocks*, and so plentifully found at *Cornwell* and *Whately*; at *Hanborough*, *Fawler*, and in *Cornbury Park*. Not but that very good *Lime* may be had from stone that shews not the least of this sign, as at *Bladen Quarry*, and many other places, but that none makes better then the stone that has it; except hereafter it may be found true here, what *Lachmund*^e asserts of the *Bishoprick of Hildesheim*, where the best (he says) is made of the hardest stone, *quod varia in se Conchyliæ continet*, set full of *petrified shell-fish*: for if so, our best *Lime-stone* must be at *Charleton* and *Langley*; at *Little Milton*, and *Shot-over Forrest*, in the Quarry there on the north side of the Hill, not far from the way to Sir *Timothy Tyrrells*; at all which places, the stone is stuck full of *Cockles*, *Escallops*, and *Oysters*, of which more anon in the following Chapter.

33. Beside the stone that is used for the *substance*, there is other that serves for the *ornament* of Building, a sort of *gray Marble* dug in the Parish of *Blechington*, in the Lordship of the Right Honorable *Arthur Earl of Anglesey*, Lord *Privy Seal*: Of this there are several *Chimney-pieces* and *Pavements*, in his *Lordships House* there, well worth the notice; as also at the Right Honorable the *Earl of Clarendon's* at *Cornbury*. And of this are the *Pillars* of the *Portico's* at *St. Johns College* in *Oxford*. They make beside of it *Tomb-stones* and *Tables*, and of late also *Mill-stones*, good enough for the *Oyl-mills*; but not for the *Corn-mills*, because of its supposed sweating, to which this is subject in rainy weather, like all other *Marbles*.

34. Some other *stones* there are of inferior use, which yet must by no means be past by in silence; whereof I know one so like the *Tripoli-stone*, in colour, consistence, and for all its uses, that I cannot but think it of the very same kind: to *silver* it gave that very lasting brightness, that another piece of *Plate* that was tryed against it, receiv'd from the *Gold-smiths Tripoli-stone*, and proved it self in all respects so much the very same; that would any thing please us not far fetch'd, perhaps there might be no further need of sending any more to *Africa* for it.

^e *Lach.* 'Ορυκτογραφία, Sect. 3. cap. 1.

35. Nor must I forget the *Iron-stone* at *Shot-over*, though occasionally mention'd, and its uses declared, in the immediately preceding *Chapter of Earths*: so called, not from any such metal that it holds, but meerly I suppose from the colour 'tis off. This I tryed with the *Load-stone* and *Aqua fortis*, thinking thereby, if it held any *Iron*, it must needs have confest it to one of those two. But I since have found the *Experiments* but ill applyed, for neither will *Cavala* (which is the best *Iron-ore*) answer either of them: So that I do not now condemn it to be no *Iron-ore*, upon those grounds as at first, but from other considerable differences it has from the known *Iron-ores* of *Glocester-shire* and *Sussex*.

36. There is also near *Thame* on *Cuttlebrook-side*, another *Iron-colour'd stone*, but more spongy than the former, and including within it a blackish kind of *Cinder*; the most like, of any thing I yet have seen, to *Magnesia* (in the *Glass-houses*, called *Manganese*) only it wants of its closeness of texture and weight: what it should be, or for what use likely, to me I confess is wholly unknown, unless I may call it the *Siderites* of *Pliny*^f. I therefore desist to say more about it, but commend it to the discovery of future ages.

37. At *Fyfield-merrymouth*, in the Field above the *Cave* lately made by Mr. *Bray*, in the bank near the Brook, I found a *Stone* of a light yellow colour, made up of glittering *Lamellæ*, or Plates, which according to the description of *Georgius Agricola*^g, seems not unlike the *Samian-stone*, found also about *Hafsa* in the Bishoprick of *Hildesheime*, and good only for polishing *silver* and *gold*. Such laminated Stones by *Nicolas Steno*^h are thought to be nothing but *incrustations*, made in the confines of a *fluid* and *solid*, an opinion that seems to come near to the truth. However it be, it is something *formed*, and may well serve to usher in the next Chapter, which I have wholly reserved for *formed stones*.

^f *Hist. Nat. lib. 37. c. 10.* ^g *Fossilium, lib. 5.* ^h *In Prodromo.*

C H A P. V.

of Formed Stones.

AFTER *Stones* made to serve the *necessities* of Man, and not brought into *form* but by the tool of the *Artist*, come we next to consider those that are *naturally formed*, and seem rather to be made for his *admiration* than *use*. Whereof the World is beautified with so great variety, that as on the one hand I cannot but wonder at the great Providence of *God*, and his most perfect Workmanship, that has thus created the *Universe* for Mans *delight* as well as *use*: so on the other, I cannot but reprehend the petulant despisers of this innocent sort of Learning, who in derision have called it, *picking of stones*; as if what the Omnipotent and most wise *God* hath thought fit to *create*, were not worth the consideration of weak *Man*. But let such malicious Scoffers know, that 'tis their pride and ignorance that has engaged them in this Censure: for as *God* has created them, so some things must be written off meerly for information, as well as others that tend to our advantage. Beside, who knows but these things may have a use, that hereafter may be discover'd, though not known at present. Since then their Exceptions are so ill grounded, that they vanish in a manner as soon as named, 'tis but just that I pay them in their own coyn, and slight their judgment more than they dare do my *subject*.

2. In the handling whereof, though in a particular *Chapter*, I shall observe the method of the whole *Essay*: And first treat of such *formed stones* as either in name, or thing, or both, relate to the *Heavenly Bodies* or *Air*; and next, such as belong to the *Watery Kingdom*: After them, such as resemble *Plants* and *Animals*, whether in the whole, or parts. And lastly such *stones*, wherein contrary to all rule, *Dame Nature* seems to imitate *Art*; for so far from idleness (says a very good Author¹) is Nature in the bowels and dark caverns of the earth, that she continually plays the *Geometrician* there, and presents us with Bodies, almost of all kinds, in *stone*.

¹ *Encelivus, de re Metallica, cap. 7.*

3. Amongst the *stones* that have relation to the *Heavenly Bodies*, the first place I think may be reasonably given to such as respect the *greater Lights*; upon which account, since the *Heliotrope* is not found here, much less the *Gemma Solis*, mentioned by *Pliny*^k: The *Selenites* or *Moon-stone* must have the precedence, which we find in great plenty in a bluish clay that lies above the Rock at *Heddington Quarry*, and in digging Wells, &c. at *Hampton-Gay* and *Hanborough*.

4. Where by the way let it be noted, that I intend not by the *Moon-stone*, the grey *Tephrites* of *Pliny*^l, that grows like a *Crescent*; by the *Greeks* called *Menöis*; nor that other strange stone mention'd by *Pliny* and the Poet *Marbodeus*^m, corporeally containing the Figure of the *Moon* increasing and decreasing, like that in the *heavens*: but a stone so called; not from its figure, but (as 'tis honestly confest by *Gesner*ⁿ and *Agricola*^o) that only represents the Image of the *Moon*, in all its *phases*, but best at full, just as it were in a glass, and therefore by Authors is sometimes called also *Lapis specularis*.

5. And thus much will our *Selenites* do, if obverted to the raies of the *Moon* in right angles; which if all that is really intended by the name, (for the very same reason) I know not why it may not as well be called the *Sun-stone* too, since it equally represents the one as well as the other.

6. But though it hath nothing of the *Moon* in figure, yet it is commonly found of a certain shape, in circuit *hexangular*, but with two of the sides broader and more depressed, in the form of a *Rhomboides*, as in *Tab. 2. Fig. 1. a.* and therefore the learned *Steno*^p (which I think its best name) not unfitly stiled it *Selenites Rhomboides*. Besides the two larger *Rhomboidal* sides, it hath eight others of an oblong square, in all making up a *decadrum parallelipipedum*; whereof the squares of the two shorter sides of the great *Rhomboides*, one is sometimes a *right angled inequilateral parallelogram*, as in *Tab. 2. Fig. 1.* and the other a *Rhomboid*; and sometimes again they are both *Rhomboids*; but those on the longest sides of the great *Rhomboids*, as far as I have observed, are always *Trapeziums*.

7. As to its texture, the grain runs several ways, but flits the

^k Nat. Hist. lib. 37. cap. 10. ^l Nat. Hist. loco citato. ^m Musæum Calceolarium, sect. 3. ⁿ De figuris lapidum, cap. 2. ^o De Natura Fossilium, lib. 5. ^p In Prodomo, pag. 74.

easiest of any of them, in a *planum* to the more depressed *Rhomboidal* sides; which way it may be cut into very thin plates by *Aldrovandus*⁹, called *Scaias*, for which reason 'tis called also *Alumen Scaiolæ*; not that it has the taste of *Alum*, or any thing like it. It breaks also another way into small *threds*, of which it seems chiefly to be composed, much after the manner of *Amiantus* or *Talc*, but its parts not so pliant as either of them: these *threds* lie for the most part, close and parallel to the longer sides of the great *Rhomboids*, as they are describ'd in *Tab. 2.* though I have seen them sometimes also parallel to the shorter; but they seem not to be continued the whole breadth of the *Rhomboid*, but divided by other parallel lines of a greater distance, that sometimes are subtended to the *acute* angles of the *Rhomboid*, but most commonly run in a more oblique posture, as may likewise be seen in *Fig. 1. a.* In these lines its parts are also easily separated, but breaking short off, and nothing so flexible as they are when broken as the *threds* run. According to some peculiar positions of these parts, there are some of them that really represent the *Rain-bow*, whereof I have some with the colours as vivid, as I ever saw any in a glass *Prism*. Of these *Aldrovandus* had one out of *Cyprus*, of which he has given us a Cut in his *Musæum*¹; but it being in Mans power to make these *Rain-bows* as he pleases, I think even those we find thus, to belong of the two rather to casualty than nature, and therefore pass them by.

8. There is, 'tis true, a sort of them of a different figure, not so easily to be met with, with only two depressed sides, and scarce any angles, but what are so *obtuse* that they deserve not the name, in the whole almost of an *Oval* form, as represented *Tab. 2. Fig. 1. b.* This sort of *Selenites*, besides the shape, is also so different from the former in texture, that it flits not like that into plates or scales, parallel to the most depressed sides, but quite contrary parallel to the thickness only; which I take to be a *character* abundantly sufficient, to make it of a different *species* from the other, though in the rest of their texture they be much the same.

9. About the origin of this matter, Authors differ much; amongst whom *Galen*^s makes it the dew of Heaven, congeled, as he says, by the light of the *Moon*, and therefore calls it by the name of *Aphroselinum*, but restrains the performance of the feat

⁹ *Musæum Metallicum, lib. 4. cap. 33.* ¹ *Lib. 4. cap. 33.* ^s *Lib de Simp. Med. ad Patern.*

to *Egypt*. *Encelius*^t thinks it a sort of moisture of the earth, so concreted, that like *Chrystal* it will not dissolve, but remains as it were an indissoluble *Ice*, whence the *Germans* took occasion to call it *Glacies Mariæ*. But that learned and industrious investigator of Nature, *Georgius Agricola*, differs from them all, and makes it a product of *Lime-stone* and *water*, *Gignitur* (says he) *ex saxo calcis cum pauca aquâ permisto*^u; and thus I find it to grow here with us at *Heddington*, in a blue clay that lies over the Quarry, whose outermost crust is a hard *Lime-stone*.

10. The learned and ingenious *Steno*^w in his *Prodromus*, thinks *Chrystal*s and *Selenites*'s, and all other Bodies having a smooth surface to have been already hardened, when the matter of the Earth, or stones containing them, was yet a *fluid*; if so, indeed *Agricola* must be out in his aim. But I cannot see how our bed of clay at *Heddington*, above the Quarry at some places ten foot thick, could have been a *fluid* within some ages past; and yet of the *Selenites*'s of the *Rhomboidal* Figure, I find some as small as a Barley-corn; some about three inches, and others again at least half a foot long: so that they seem rather to have some succession of growth, and now to be in *feri*; than to have been all together already hardened, when the clay that now contains them was but a *fluid*. Beside, they then would have been found close together, whereas we here meet them some higher some lower, and mix'd all together little and great; and the very clay it self, as 'tis broken to pieces, seeming somewhat inclinable to this sort of form.

11. A third sort we have of them also found here at *Heddington*, in the very same clay, as also at *Cornwell* and *Hanwell*; with two sides like the former, more depressed then the other, in compass also *hexangular* (the thinnest sides of them being divided by a ridge) but in the form, not of a *Rhomboid*, but an *inequilateral parallelogram*, as in *Tab. 2. Fig. 1. d**. Some of these we find single, lying in any posture, the biggest scarce an inch broad, or above four inches long; and others joined together in a certain position, with their flattest sides towards each other, and edges downward, and their ends constantly meeting in a *center*. The Ingenious Sir *Thomas Pennyston* has observed, that at *Cornwell* they generally lye in *ternaries*, but here at *Heddington* we find them

^t De Lapidibus & Gemmis, lib. 3. cap. 56. ^u De Natura Fossilium, lib. 5. ^w Prodromi prop. 1. observat. 1. * There are such as these in Spain, Thuringia, and Cappadocia. Aldrovand. lib. 4. cap. 33.

oftentimes more, and not unfrequently *irradiating* all manner of ways into the form of a *Globe*, the several *Selenites*, like so many *radii*, all pointing to the *center*, as is plainly represented by one half of such a *globe* of them, in *Tab. 2. Fig. 1. c.*

12. The texture of these is something agreeable, and something different from the *Rhomboideal Selenites*, for they all cleave in a *planum* to the flattest sides, and seem to consist of small *threads* like them; but some have the *threads* running obliquely to the whole square, as in the lower part of *Fig. 1. d.* others have them meeting in the middle of the flat in an *obtuse* angle, as in the upper part of the same *Figure*.

13. The meeting of which *threads* so in an *obtuse* angle, I thought at first might have very well occasioned that representation of the *gramen segetum paniculâ sparsa*, fair *panicked corn* or *bent-grass*, to be seen in most, if not all of this kind (which like a *fly* or *spider* in *amber*) seem to be included at each end of them; with the *panicles* turned contrary to each other: But I quickly found my self mistaken, by flitting of several, whereby I discovered, that the *threads* sometimes ran quite contrary to the spreading *panicles* of the *corn* or *bent-grass* (so very well counterfeited in many of them) and therefore not likely to give that form: And that the thing it self was nothing but clay; thus pretily dispersed in the form of a *bent*; which beside the pleasure of the surprizal, gave me another argument against *Steno's* opinion, *That Selenites's were all hardened, when their beds they now lie in were nothing but fluids*: for it cannot well be conceived how the clay should any way get to be within them; had it not had a being before the *selenites*; and thus included at the time of their formation.

14. Of *formed stones*, though there are few that have any, yet some there are of eminent use, and such is our *selenites* or *specular stone*; good taken inwardly for many distempers, number'd up by *Cerutus*^y, *Aldrovandus*^z and *Galen*^a; and externally to take away the *blemishes of the face*. In ancient times, before the invention of *glass*, it was of very great use for *Lanterns* and *Windows*, it being easily slit into very thin plates, yet loosing nothing thereby of its *diaphaneity*. Of this says *Agricola*^b, are the

^y In Museo Calceolario, scilicet 3. ^z Lib. 4. cap. 33. Mus. Metal. ^a De Simp. Med. facult. lib. 9. ^b De Natura Fossilium. lib. 5.

Church-windows made at *Caswick* in *Saxony*, and *Merseburg* in *Thuringia*, which certainly must be of a different sort, from what is described by *Aldrovandus*^c and *Wormius*^d: the one whereof says 'tis *imbrium impatiens*; and the other, *humido corruptibilis*. I exposed this of ours many rainy days, but could not find that from the weather it received any damage, and therefore guess it to be the same describ'd by *Agricola*: I steeped it likewise many days in water, but found not any sensible alteration of its body, though it gave the water both an odd smell and taste. As for *Lanterns* and *Windows*; so they anciently used it in making of *Bee-hives*; that through it they might see the *Bees* operations, as in *glass-hives* now: an Invention by some people taken for new, though very well known in the days of *Pliny*^e:

15. Out of burnt *selenites* is made the best *gypsum*, for *Plastering*, *Images*, *Fret-works*, &c. When burn'd, it turns to a pure white *Calx*, by the *Italians* called *Gesso*, from the Latin word *gypsum*: Of this they make those curious counterfeit *Tables*, like *Marble* in-laid with divers *Prétious stones*; in the forms of *Animals*, *Plants*, &c. The way of making them is taught us by *Kircher*^f; but there is a friend of mine has a better *method*, who intends very speedily to make some attempt to make them in *England*, and of *English* materials. And so much for our first formed stone *Selenites*, on which I had not dwelt so long, but to supply the defects of other Authors, whose descriptions of it are but mean and imperfect:

16. After the *Moon-stone*, the *Asteria*, or *Star-stones*, next offer themselves to our consideration, which, to avoid the confusion of other Authors, I shall only call those, whose whole Bodies make the form of a *Star*, as in *Tab. 2. Fig. 2, 3*, in opposition to the *Astroites*, which in the whole are irregular, but adorned as it were with a *Constellation*, as in *Fig. 4, 5, 6* and *7*.

17. The *Asteria*, or *star-stone*; otherwise by *Gesner*^g called *Sphragis Asteros*, or *sigillum stellæ*, because of the use it is sometimes put to, is plentifully found in the Fields at *Cleydon*, the most Northern Parish of the whole County, Northward from the Church, and particularly on the Furlong called *Hore-stone* Furlong: the texture of as many as I have yet seen, seems to be

^c *Mus. Metal. lib. 4. c. 33.* ^d *In Museo, cap. 7.* ^e *Nat. Hist. lib. 21. cap. 14.* ^f *Kircheri Mundus subterr. Lib. 12. sect. 5. part. 3. cap. 3.* ^g *De Figuris Lapidum, cap. 2.*

of thin *lamellæ* or plates, lying obliquely to the *Horizontal* position of the *Star*, much after the manner of *Lapis Judaicus*, and their colour various, according to the different Soils they are found in: whence 'tis; that in *Glocester-shire* and *Tork-shire*, where they are taken out of a blew clay, they are almost themselves of the same colour, breaking, as the Ingenious Mr. *Lister* informs us^h, *Flint-like*, and of a dark shining politure. In *Warwick-shire* they are accordingly, and in some places also of *Glocester-shire*, of a cinereous colour. And here at *Cleydon*, because taken forth of a yellowish earth, of a yellow colour, herein varying from all I had seen before. They differ much also from those of other *Counties* in circumference and softness; for here we have them ordinarily of above an inch and half, and scarce any so little as an inch in compass; than which in those *Counties* there are but few bigger. And whereas in other *Counties* they are so hard and so firmly cemented, that 'tis very difficult, if at all possible, to separate them from each other, without spoiling the *Intagli* or workmanship of the Stars; these if but steeped a night in *vinegar*, or other sharp liquor, may be divided the next morning with safety and ease.

18. And as in colour, circumference, and hardness; so these sometimes differ from those of other places in *figure* too, as *Tab. 2. Fig. 2.* where beside the sculpture that makes up the angles, there is plainly represented a *rose*, or other *uniform* figure, in the middle of it, which I never saw at any other place, nor indeed are such often to be met with there.

19. In all other matters, I think these *Asteriæ* of *Cleydon* agree with the accurate description of them, by the Ingenious Mr. *Lister*ⁱ; all seeming to be fragments, and no intire Bodies, and found either in one single joint, as in *Tab. 2. Fig. 2.* or in 2, 3, 4, 6, 8, 10, or 15 heaped together, as in *Fig. 3.* making a *pentagonal cylindrical column*, of which I met with none that were full an inch long; but however, guess that about 20 *joynts*, as in other places, may go to an inch: every *joynt* consists of *five angles*, which in some are very *obtuse*, in others more *acute*; the middle of each *angle* is a little hollowed, and the edges more prominent and thick furrowed, by which the several *joynts* are knit together, their ridges and furrows being alternately let into

^h *Philosoph. Transact. Numb. 112.* ⁱ *Ibid.*

one another. In the *center* of the *five angles* is a small hole, conspicuous enough in most of them; but in some I have observed the small hole on one side, and a little prominency on the other, fit as it were to be let in to the *Central-hole* of the next *joynt*, after the manner of the ridges and furrows of the *angles*.

20. Many of these longest jointed *Asteriæ*, have certain *joynts* a thought broader and more prominent than others, dividing the whole body as it were into certain *conjugations*, of two, three, or more *joynts*; which *conjugations*, says the learned and curious Observer, Mr. *Lister*^k, are marked (as he calls them) with sets of *Wyers*, which though I could not perceive in any found at *Cleydon*, yet when I put a *column* of them into *Vinegar*, at those very places I could perceive *bubbles*, standing as it were at the *orifices*, where formerly these *Wyers* were in all likelihood inserted, by no means otherwise visible to the eye. And whereas 'tis certain that most of these in other *Counties*, if of any considerable length, are not straight, but visibly bent and inclining; these are not now, or scarce appear to have ever been so, though possibly this may rather be referred to the shortness of those I met with, or ill luck in finding none of the kind, than to any different operation in nature here, from her usual performances in other places.

21. They are found also about *Swerford* of the same colour, but nothing so plentifully, or large as these at *Cleydon*, for the biggest I found there was scarce an inch round; in all other respects they correspond with them, only the *conjugations*, made by the prominence of some *joynts* beyond the rest, are more visible in these than in any at *Cleydon*.

22. Of *Astroites* or *Starry-stones*, such as in bulk are *irregular*, but adorned all over with many *stars*, there are no less in this *County* than four several sorts: Whereof, in two, the stars are in *mezzo Rilievo*, prominent, and standing outward, with the *striae* or *streaks* descending from the Center at the top, on all sides to the Rock on which they grow. Some of these are of a larger, as *Tab. 2. Fig. 4.* and others of a smaller kind, as *Tab. 2. Fig. 5.* both found in the Quarries of *rubble-stone*, dug only for mending the High-ways, not far from the foot of *Shot-over Hill*, on the right hand of the road from *Oxford* to *London*, in the Parish of *Heddington*.

^k *Philosoph. Transact. loco citato.*

23. A *third* sort there is, and indeed the most beautiful of any it has been hitherto my luck to meet with, to be had in the Fields about *Steeple-Barton*, first discovered to me by a worthy Gentleman, since deceased, the Worshipful *Edward Sheldon* Esq; to whose furtherance of my design I am not a little indebted. But these, quite contrary to the former, are *Intagli*, deeply engraven like a *seal*, and striated from the prominent edges above (which for the most part are *Hexagons*, and sometimes *Pentagons*) to a *center* in the bottom, as in *Tab. 2. Fig. 6.* yet agree with the former in this, that the Stars of all three are only superficial, and not to be found in the body of the stone, and have none of them (that I know of) been any where noted before.

24. To these add a *fourth* sort, imperfectly described by *Gesner*, and out of him by several others; whose *striae*, like the *third* sort, descend in a *concave*, but from edges most times *round*, or *quincunangular* at the top, and tend to a *center* not of their own kind, as in *Fig. 6.* but smooth; and not depressed, but visibly prominent, as in *Fig. 7.* These are found in the afore-mentioned Quarries of rubble-stone in the *Parish* of *Heddington*, and are *stellated* not only in the *superficies* of the stone, but quite through the whole depth of it, yet not so that one continued *star* (as some have thought) does reach through it; but many, according to the thickness of the *stone*, about ten of them lying in the depth of an *inch*, much after the manner of the *Asteria* or *Star-stones*, only they are not separate, but joined together, and making as it were so many *ranges* in the *stone*, which are clearly represented by *Fig. 8.* which shews the face of such a *stone*, cut parallel to the descent of the *stars* in its body, which lie within one another like so many *cones*.

25. Of this sort in *France* there are some so great, as *Gesner*^m was informed by *Petrus Bellonius*, that they used them in building of *Walls* and *Houses*; to which use 'tis true we do not put *ours*, but I suppose it is not for want of *bigness*, but because we have much better stone for that purpose; for here we have them likewise so plentifully and great, that we commonly pave our *Causeys* with them, as may be seen in the *Causey* without *St. Clements*, leading from *Oxford* up *Heddington hill*.

26. Having hitherto considered these *stones* apart, and seen

how they differ from one another, let us now consider them all together in that admired quality of their *moving in Vinegar*, which in some measure is found in the *Astroites*, but is much more signal in the *Asteria* or *Star-Stones*: for the *Astroites* must be broken in very small pieces before they will move, though put in good *Vinegar*, but the *Asteria* will move not only in a whole joynt, but two or three of them knit together, which I have often seen done by the yellow ones of *Cleydon*, though of greater bulk than those of other places; which joined, with some other circumstances anon to be mention'd, has given me ground to suspect, if not conclude, that though it may be true enough what Mr. *Lister*^a has asserted, as well of all *fossils*, as the *stones Astroites*, that as many of them as *Vinegar* will corrode as a *Menstruum*, do all move in it; yet none of them reach the effects it has on the *Asteria*, to which therefore I must crave leave to allow somewhat more than either to the *Astroites* or any other *fossils*.

27. For beside the *progressive motion* to be seen in those, the *Asteria* has a motion of *circumgyration*, and moves brisker and longer than any of them; for though it hath been steeped in *Vinegar* three or four days, yet upon infusion of a fresh *acid*, it still sends forth many little *bubbles* as at first, from underneath it, in the instant of its motion: which seems to argue, that it has it not wholly from the corrosion of the *Menstruum*, but in part at least from some other principle, which I take to be a *spirituous*, yet *corporeal effluvium*, continually flowing from it, when provoked by an *acid*.

28. Whereof there is *one*, which hereafter shall be publick, found out indeed by chance at the House of Mr. *Wildgose*, *Physician* at *Denton*, and an ingenious *Chymist*, whose assistances (in gratitude) I must ever own: where not having *Vinegar* so ready at hand, we thought fit to make use of another suitable *liquor*, which so effectually excited the *effluvia* of the stone, that they ascended in a cloud to the surface of the *Menstruum*, and there settled exactly in the form of the *stone*, and that not only of a single joynt, but a whole *column* of them together: which perswaded me, that *Cardan*^o was not so far out of the way, nor deserved so much the reproofs of *Aldrovandus*^p and others, for asserting the motion of such *stones* to arise, from vapors expelled from

^a *Philosoph. Transact. Numb. 100.* ^o *Subtilit. Lib. 5.* ^p *Museum Metallic. lib. 4. cap. 65.*

them by the power of the *Vinegar*. Since perhaps his position (though not so well made out) comes nearer to truth than any his *Animadvertisers* have brought for it since.

29. After the *stones* some way related to the *Celestial Bodies*, I descend next to such as (by the *vulgar* at least) are thought to be sent us from the *inferior Heaven*, to be generated in the *clouds*, and discharged thence in the times of *thunder* and *violent showers*: for which very reason, and no other that we know of, the ancient *Naturalists* coined them suitable names, and called such as they were pleased to think fell in the *Thunder*, *Brontia*; and those that fell in *showers*, by the name of *Ombria*: Which though amongst other Authors has been the only reason why these have had place next the *stellated stones*, yet methinks it is due to most of them, by a much better pretence, having something upon them that rather resembles a *star* of five points, than any thing coming from the *clouds*, or the Fish *Echinus*; to the shell whereof deprived of its prickles, *Ulysses Aldrovandus*⁹, and some others, have compared them, and therefore called them *Echinites*. However, I think fit rather to retain the old names, though but ill applied to the nature of the things, than put my self to the trouble of inventing new ones.

30. Of *Brontia* therefore, or *Ombria* (call them which you will) we have several sorts in *Oxford-shire*, which yet all agree in this, that they are a sort of *solid irregular Hemispheres*; some of them *oblong*, and having somewhat of an *oval*; others either more elevated, or depressed on their *bases*. All of them divided into *five parts*, most times unequal, rarely equal, by five *rays* issuant from an *umbilicus* or *center*, descending from it down the sides of the body, and terminating again somewhere in the base. They are never found in beds together, like some other formed stones, nor that I have yet heard of (says the Ingenious Mr. Ray^r) in great numbers in one place: but in the latter I must take leave to inform him, that though I think it in the main to be true, yet that at *Tangley*, *Fulbrook*, and all about *Burford*, they are found in such plenty, that I believe it were easie in a little time, to procure a Cart-load of the first sort of them, carefully exhibited in *Tab. 2. Fig. 9, 10.*

31. Whose innermost texture, though it seem to be nothing

⁹ *Museum Metallic. lib. 4. cap. 1.* r *Observations Topograph. &c. p. 116.*

more than a coarse rubble-stone, yet is thinly cased over with a fine *laminated* substance (the *plates* lying obliquely) much like *Lapis Judaicus*: In form they are flat, depressed upon the *basis*; in colour generally yellow, their *rays* made of a double rank of *transverse* lines, with void spaces between the ranks, visible enough on the top of the stone *Fig. 9.* but not so distinguishable on the bottom *Fig. 10.* the whole body of the stone, as well as the spaces included within the *rays*, being elsewhere filled with *Annulets*, much more curiously wrought by *Nature*, than by the tool of the *Graver*.

32. The *center* of these *rays*, by *Pliny* called *Modiolus*, by *Aristotle*, *Umbilicus*^s, is never placed on the top of the stone, but always inclining to one side, as that at the bottom do's to the other; the *Axis* lying obliquely to the *Horizon* of the stone. Which gave occasion to a Learned Society of *Virtuosi*, that during the late Usurpation lived obscurely at *Tangley*, and had then time to think of so mean a subject, by consent to term it the *Polar-stone*; having ingeniously found out, by clapping two of them together, as suppose the *Fig. 9.* and *10.* that they made up a *Globe*, with *Meridians* descending to the *Horizon*, and the *Pole* elevated; very nearly corresponding to the real *elevation* of the *Pole* of the place where the *stones* are found.

33. The two next, represented *Fig. 11, 12.* like the former, being flat and depressed on their *bases*, having also some resemblance of a *Star* of 5 points, were therefore thought fit to be placed next. Whereof the *11* indeed is a beautiful stone, found somewhere in the *Chiltern* about *Aston Rowant*, whose inner substance, though of *black Flint*, to outward view is of a cinereous colour, and adorned by *Nature* with somewhat more than ordinariness. For beside the *Modiolus*, and the issuing *rays* made of double ranks of *points*, with *transverse lines* interceding them, it is also set with other *points* surrounded with double *Annulets*; on each side the *stone* with a single, and from the terminations of the *rays* with double ranks. The *points* thus surrounded, are neither deeply excavated, nor any thing prominent above the *superficies* of the stone; but the *rays* as they are but short (not extending above half way to the *rim* of the *stone*) so they are deeply hollowed down within it, wherein it differs,

^s *Lib. de Mundo ad Alexandrum.*

33. From that of *Fig. 12.* found in the Fields about *Isley*, whose *rays* like those of the *Polar stones*, are made of double ranks of *transverse lines*, whereof the outermost are much the longer, and extended likewise to the *rim* of the *stone*; its substance also like that seems to be a yellow rubble, but not cased that I can perceive with any such *laminated* substance, or adorned with *Annulets*, yet the *Umbilicus* of some of them, is more beautiful than theirs, it being sometimes divided and foliated like a *Rose*. And so much for the *Brontia* depressed on their *bases*.

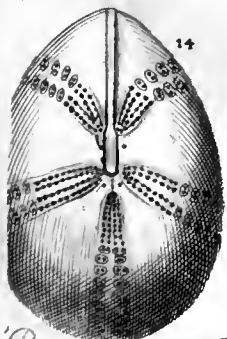
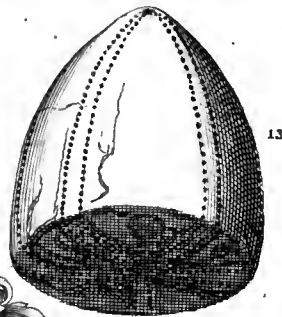
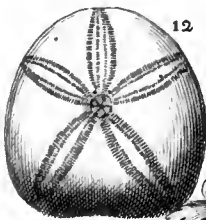
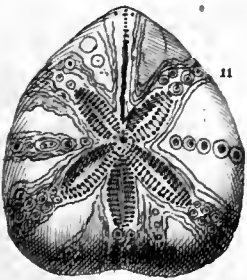
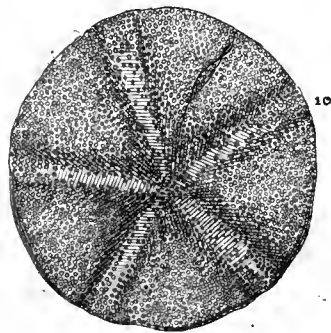
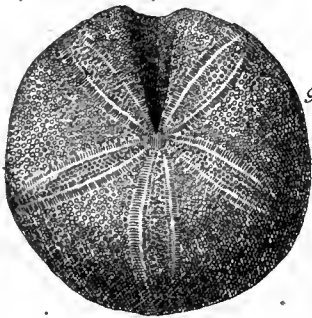
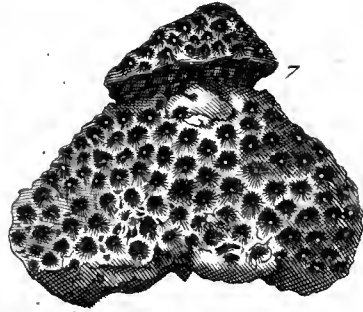
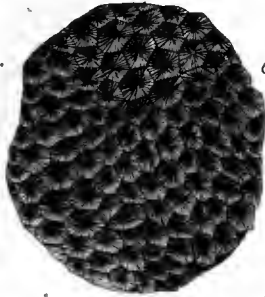
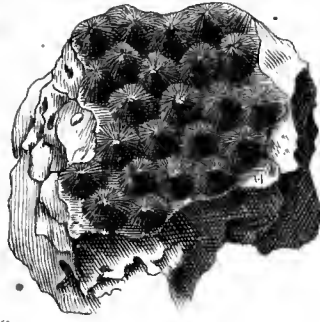
35. Let us now proceed to others of a more elevated kind, whereof those expressed *Fig. 13.* found somewhere in the *Chiltern*, by the Country people called commonly *Cap-stones*, from their likeness to a *Cap* laced down the sides, are of any the most uniform. For the *centers* of these, both at the top and bottom, are on all hands equidistant from the *rim* of the *stone*, and the *rays* interceding the *centers* being also equidistant, cut it exactly into five equal parts; which in none of the former, nor those that are to follow, either by reason of their shape, or *excentricity* of their *Modioli*, can possibly be found. The *rays* of these are made of two rows of *points* set pretty deep in the body of the *stone*, out of which you are to suppose, according to *Aldrovandus* (who resembles this *stone* to a disarmed *Echinus*) proceeded the prickles that *Animal* is fenced with.

36. As also that other somewhat of an *oval* form, *Tab. 2. Fig. 14.* whose *center* corresponds with the figure of the *stone*, and is not concluded within the *rays*, as in the former, but is extended in a ridge to the *rim* of it: from which *center* there descend as it were double *rays*, made up of two double sets of *points*; which, expanding themselves as they draw toward the *rim*, at about midway are surrounded with single *Annulets*, which each of them including two *points* apiece, are therefore all of an *oval* Figure. Its substance within is a *black Flint*, though without it appears of a *cinereous* colour, and was found in the Fields between *Exelm* and *Brightwell*.

37. At *Pyrton* I met with another of these, a *black Flint* within, and *cinereous* without, of *oval* figure and *center* like the former, but the descending *rays* from it of a quite different kind: for whereas they were made of *points* hollow and deep, these on the contrary are all *prominent*; and whereas they descended



Fig. 1.



scended in double *branches* and *points*, which near the *rim* were included in oval *Annulets*; the double and *protuberant points* of these, about mid-way to the *rim* are turned into single, though much larger ones, as in *Tab. 3. Fig. 1.* which now descending in single *points*, and meeting in an *Umbilicus* not in the middle of the *basis*, but so much to one side, that the branches upon this account being some longer some shorter, and crossing the *basis* in a much different manner, make a figure somewhat resembling a *Flower-de-lis*, as in *Tab. 3. Fig. 2.* which had been all I should have said concerning these *Brontia*, but that perhaps it may not be unworthy our notice.

1. That the *protuberancies* of this last *stone* are all hollow, which when broken, look just like the hollow *points* of the former; which has given me some ground to suspect, that the deep *points* of that may have formerly been *eminencies* like the raised *points* of this, and are only broken down by the injuries of time.
2. That none of these *Brontia* have been described before, but the 12 and 13 of *Tab. 2.* which indeed are somewhat like the 8 and 10 of *Aldrovandus*^c: and
3. That though some Authors have thought them the petrified shells of the *Echinus Spatagus*, or *Brissus* of *Aristotle*, I have reason to think (as shall appear in a fitter place) that they will prove nothing less.

38. Beside the *Brontia* of the Foreign *Naturalists*, we have others, which here in *England* we call likewise *Thunder-bolts*, in the form of *arrows beads*, and thought by the vulgar to be indeed the darts of *Heaven*: which only in conformity to my own Country (though for as much reason as the foregoing *Brontia*) I have placed amongst the *stones* related to the *Heavens*.

39. From their form, by all *Naturalists* they are called *Belemnites*, from the Greek word Βελεμιον *telum*, which indeed there are some of them represent pretty well. We have of them in *Oxford-shire* of divers sorts, yet all of them I find agreeing in this, that their *texture* is of small *stria*, or threads radiating from the *center*, or rather *axis* of the *Stone*, to the outermost *superficies*; and that burn'd, or rub'd against one another, or

^c Lib. 4. cap. 1. p. 455.

scraped with a knife, they yield an odour like rasped Horn.

40. In magnitude and colour they differ much, the biggest I have met with yet, being that exprest in *Tab. 3. Fig. 3.* in length somewhat above four inches, and in *thickness* much about an inch and $\frac{1}{4}$. This was found in the Quarries in the Parish of *Heddington*, hollow at the top about an inch deep; and filled with a kind of gravelly earth; and has the *rima* or *chink*, which *Aldrovandus* and *Boetius* say all of them have; but I find it otherwise, as shall be shewn anon. Of colour it is *cinereous*, inclining to *yellow*, and if vehemently rubb'd, is the only one amongst all that I have, that like *Amber* takes up *straws*, and some other light bodies.

41. There are of them also of a *bluish* colour, found at *Great Rolwright* in a *bluish* clay, of about a fingers length, hollow at the top, and have some of them, instead of one, three *clefts* or *rimæ*, but neither so plain or long as the former, they ascending from the *cuspis* scarce half up the stone: two whereof are shewn *Fig. 4.* and the third hidden behind the *Sculpture*; which may make some amends for that of *Fig. 5.* which is of colour *cinereous* and hollow at the top, but has no *chink* at all; whereof there was a bed found in digging the *Sulphur Well* at Mr. *Lanes* of *Deddington*, as was mentioned before in the *Chapter of Waters*.

42. To which add a *fourth* sort, found in great plenty in the Gravel-pits without *St. Clements*, in the *suburbs* of *Oxford*, very few of them hollow at the top like the former, but radiated like a *star* from a closer *center*, as in *Fig. 6**. which made *Gesner*^u think it to be the *Astrapias* of *Pliny*, though expressly he says, 'tis of a *white* or *azure*^w, whereas this is always of an *amber* colour: yet draws not *straws*, is somewhat transparent, and may therefore pass for a sort of *Lapis Lyncurius*; not that it has original from the urine of that *Beast*, for we have plenty of the stones here and none of the *animals*, but from the unpleasant smell it has when burn'd or brayed; like the urine of *Cats*, or such like ramish creatures, whereof the *Lynx* perhaps may be one. These, most of them, are made tapering to a point like the former; yet sometimes having a blunter ending; and the *chink* on both sides, I thought fit rather to shew it in that form than the other, as in

* These not being hollow at the top, nor containing any other stone, gravel, or earth, some call the male *Belemnites*: the three former being of the female kind. ^u *De Figuris Lapidum*, cap. 5. ^w *Nat. Hist. lib. 37. cap. 11.*

Fig. 6. where the *cleft* runs not only the whole length of the *stone*, but quite under the end, and half way up the other side.

43. Many are the *Medicinal* uses of this *stone*, mentioned by *Boetius*, *Aldrovandus*, and *Gesner*: Whereof the chief are,
1. For the *stone*, for which (instead of the *Eurrhæus*) 'tis used in *Spain* and *Saxony*. 2. For *exsiccation* of *wounds* in *Prussia* and *Pomerania*. And 3. for *ocular* distempers in *Horses*, in all parts of *England*.

44. Thus having run through the supposititious *stones* from *Heaven*; I next descend to the *Atmosphere*, or inferior *Air*, immediately encompassing the *terraqueous Globe*; which though incapable of itself to be represented in *stone*, yet having met with some related to its *Inhabitants*, I mean the *feathered Kingdom*, I thought fit to give them place before those of the *Waters*.

45. Whereof the first and only one, represented in *Sculpture Tab. 3, Fig. 7.* has perfectly the shape of an *Owls* head, which because not mention'd by any Author that I know of, I thought good to exhibit, and call *Lapis Bubonius*; it is a *black flint* within, and *cinereous* without, and was found near to *Hardwick* in the Parish of *Whitchurch*.

46. To which I might have annex'd the *stone Hieracites*, found frequently in the *Quarries* in the Parish of *Heddington*, but is not the *Hieracites* mention'd by *Pliny*^w, which he says alternately changes its colour; but of *Gesner*^x, to whose figure of it, ours is exactly like: but neither his nor ours resembling any thing of a *Hawks*, or other *Birds feathers*, so much as to deserve a *cut*, or the *Readers* view; I have saved *my self* the expence, and *him* the trouble.

47. Next the *Air*, the *stones* that concern the *Watery Kingdom*, fall in order of Nature under consideration, whereof there are some that seem to be nothing else but meerly concreted drops of *water*, found plentifully in the *Fields* about *Kircklington* and *Northbrook*, which I touched on before under *petrifications*, and promised to treat of more largely here. By Authors they are called *Stalagmites*, and seem either to be generated of *pearls* of dew, settled on the *stones* as they lie in the *Fields*, which first being coated over with the small *terrene atoms* that are flying in the *Air*, and by that means kept in their own form for some considerable

^w *Lib. 37. cap. 10.* ^x *De Figuris Lapidum, cap. 13.*

time, are thus at length fix'd into a friable kind of *Stone*, by the petrifying steam that comes from the earth; or else they are *exsudations* out of the stones themselves, whence are formed those *excrefcencies* like *warts* in *Animals*: neither of which seem unagreeable to their description in *Tab. 3. Fig. 8.*

48. But beside the *Stalagmites*, there are other *concretions* made of much the same materials, *viz.* of a cold sort of *water*, thickened with *terrene* and *petrifying* particles; which yet because of their different mode of generation, have obtained a different, and more suitable name: And such are the *stones* made of nothing but such *water*, as it drops from the roofs and caverns of the Rocks, and therefore called *Stalactites*, or *Lapides stillatitii*; which, if the drops descend by the sides of the Rocks, and comply with the usual raggedness of them, are then indeed of various and the rudest forms, and by the work-men called *Craume*^r. But if the drops descend from the top of a vault, or any more prominent part of a Rock, in a direct line and free from the sides, they are commonly then of a *pyramidal* form, as in *Tab. 3. Fig. 9.* which is the representation of a *stone* of about nine inches long, of a yellowish colour, as it hung from the Rock in *Heddington* Quarry, where without doubt it was produced much after the same manner, as *Isicles* at the ends of spouts in Winter, by a gradual descent and congelation of the drops.

49. Hither also must be referred all sorts of *Spars*, by the *Miners* called *Cawke*, and the *Latins*, *Fluores*; which (say they) yet retain so much of a *fluid*, that with the heat of fire, like *Ice* in the *Sun*, they melt and flow: an effect, which though I could not find it had upon ours without the help of *Salts*; yet not doubting at all, but that once they had been *fluids*, I could not but accordingly give them place here.

50. Whereof, there is scarce any Rock whatever, whether *metalline* or *vulgar*, which has not some kind or other of them, shot in its seams or other hollows, which according to their different subjects or *matrixes*, are sometimes of different *colours*, and frequently of divers *figures*.

51. As for *colours*, I have not observed above two sorts in *Oxford-shire*, a light yellow, and a Pearl-colour'd white, where-

^r Of this there is a Quarry between *Heathrop* and *Enson*, called *Broad-stone* Quarry, that has great plenty.

of there are some in the Quarries near *Shotover*, so clear and hard, that they come not much behind the *Bristol-Stones*, and are in figure (though had from the same Quarry) as various as *Diamants*; some of them being comprised in *seven*, others in *nine*, others in *eleven*, and some in *thirteen* planes, as may easily be computed from their *trigonal*, *tetragonal*, *pentagonal*, and *hexagonal* pyramids, represented in *Tab. 3. Fig. 10.* to which, adding the *planes* of their *columns*, and the *planes* of their *bases*, whereby they are fix'd to their subjects, those numbers of *Hedræ* must needs be concluded.

52. As to the *origin* and *texture* of *Spars*, I take them to be much of the same with *Chrystals* (though we seldom find them of their *hexagonal figure*, or their *columns* ever interceding two *pyramids*) and that they differ in luster and hardness according to the more close or loose *texture* of the *stones* whereon they sit, and out of which they have sweat, as through a *strainer* or *colander*. Though it must not be denied, but what is asserted by the ingenious and observing *Steno*² concerning *Chrystals*, may have place also in the increase and growth of these, which he says (whatever may be the manner of their first delineation) is by external apposition of new *Chrystalline* matter to the external *planes* of the already delineated *Chrystal*; which he also observes, not to be joined to all its *planes*, but for the most part to the *planes* of the top only; nor to these all at a time, nor in the same quantity. Whence it is, that the extream or top *planes* of *Spars* as well as *Chrystals*, are seldom or never equal, and not always *triangular*, but rising with unequal *sides* and *angles* from the *planes* of their *columns*, as in that separate piece of *Spar* or *Chrystal* near *Fig. 10.* which I take to be *arguments* sufficiently concluding the *similitude* of their growth and *texture* of parts, notwithstanding the *planes* of the *columns* of *Spars* are not streaked, nor so plainly shew the places of apposition, as they do on *Chrystal*; which streaks, for the *Readers* more ready apprehension, are therefore cut on the separate *column* near *Fig. 10.* though otherwise indifferently to be understood either for *Spar* or *Chrystall*.

53. Some of these *Spars* fall so little short, either of *Chrystals* or *Bristol Diamants*, either in *luster* or *hardness*, that we may very well admit what is said of them by *Aldrovandus*^a, that they are *gemmae inchoatæ, & non perfectæ*. And that *Boetius*^b in all likely-

² *Prodrom. de Chrystallo. propositionib. 1. 2, 3.* ^a *Museum Metall. lib. 4. cap. 76.* ^b *De Lapid. & Gem. cap. 304.*

hood may have hit the mark, who doubts not but they are made of the same matter with *Gems*, and therefore gives them place between *Gems* and *Stones*, *Inter Gemmas & lapides medium locum obtinent fluores*, says he: to whom in this matter I readily subscribe, finding many of them to participate with *Gems* in luster, but with other *Stones* in softness and brittleness; whence it comes to pass, that they will not polish like other stones, and are only fit to be mix'd with other metals, which they render much more quick in *fusion*, than otherwise they are inclined to be of themselves.

54. After *Stones* so purely made out of *Waters*, that they readily return into *fluids* again, or have only such figures, into which that *Element* seems most naturally to compose it self, as the *Stalagmites* and *Lapides stillatitii*; come we next to such as represent its Inhabitants, the *Fishes* of the *Sea* and *fresh Waters* too: of which there are some of so great variety of texture, that in case they were not heretofore the spoils of real *Fishes* indeed, and now petrified, require a much higher principle for their efformation; concerning which before we attempt any thing, let us first consider some of their particular shapes, with the places and postures they are now found in.

55. Of such as resemble any of the *fresh water* kind, I have met with only *one* in this County, which did we but know where else to put it, should not be placed here neither; for it was taken out of a block of *coal* (whereof there is none dug in *Oxford-shire*) by the ingenious and observing Sir *Thomas Pennyston*, at his House at *Cornwell*; and seems to represent a *Carp* or *Barbel*, the best of any Fish I have yet compared it with, and rather indeed the latter of the two, because of the short and thick scale: It was broken, in taking it out of the Coal, into several pieces, whereof that is *one* exactly engraven *Tab. 3. Fig. 11.* kindly bestowed on me by that worthy *Gentleman*, and by whom the rest are carefully preserv'd; which were it not for want of the variety of colours, I should take (for the scales sake) to be the *Lepidotes* of *Pliny* ^c.

56. The *stones* that we find in this In-land Country, having the shapes of *Sea fish*, are many, but chiefly of the *testaceous* kind; whereof there are some that lie in a mass of stone together, and

others found in the Fields or Quarries apart. Of the first sort of these we have a curious instance in the possessions of the Right Honorable *Henry Earl of Clarendon*, at *Langley* in the confines of *Whichwood-forrest*, where there is a Quarry of very hard stone; wholly composed of a close union of *Cockles*, scarce any of them exceeding a Pea in bigness, and streaked circularly to the hinges of the valves, as in *Tab. 3. Fig. 12.* they are none of them hollow, but firmer within, than they are to the bed of stone where they lye; and yet even to that they are so closely knit, that the mass receives a very good polish, insomuch that his *Lordship* intends to pave the new *Chappel* now building at *Cornbury* with it.

57. This sort of Marble is mention'd by *Steno*^d, and called (as he says) by the *Italians*, *Nephiri*; whereof there is also a very good sort at *Charleton Towns end*, upon the edge of *Otmoor*^{*}, differing from that of *Langley* only in this, that the gross of the stone is somewhat whiter, the *Cockles* larger, and not so thick set. However, of so firm and close a texture, that of it they make *Tomb-stones*, *Tables*, &c. so curiously spotted and set with rings, that it very much pleases the eye of the beholder, and has already gotten (though but lately found) a reputation at *Oxford* and the parts adjacent.

58. Of this sort of stone most certainly it was, though somewhat perhaps of a softer kind, and different colour, that *Pausanias* informs us (as quoted by *Agricola*) the Monument of *Phro-neus*, and many other works, were made at *Megara*. *Megara in saxo valde albo, & reliquis lapidibus molliore, undique insunt conchæ marinæ, ex quo &c.* are the words of *Agricola*^e; for which very reason this sort of stone is there called *Conchites*, and since by *Johnston* and *Fred: Lachmund*^f (from the place where found) *Lapis Megaricus*.

59. There is another sort of it in the Quarries near *Adderbury*, thick set with *Cockles* in their full proportion, as in *Tab. 3. Fig. 13.* Some of them are wonderfully Chrystallized, and beautiful to the eye, but not being so finely cemented together, but that a knock will loosen or make them leap from their beds; and many of them being hollow, or filled with brittle *Spar*; the stone by no means will receive a polish, and upon that account fit for no other work

^a *In Prodromo.* * It is much prized by the *Painters at London*, it having a grit that cuts their colours much better than other Marble. Mr. *Aubrey's* notes. ^e *De Natura Fossilium. lib. 7.* ^f *Ορυκτογραφ. Hil-desheim. sect. 3. cap. 15.*

than to mend the *high-ways*, or some other mean uses. Nor can I inform the *owners* of these Quarries of any better that it may have, except they shall think fit to burn it for *Lime*, for which I dare promise it must needs be excellent.

60. And so is the stone *Ostracomorphos*, made of heaps of *Oysters* cemented together, and found plentifully enough on *Shot-over hill*, not far from the way to Sir *Timothy Tyrrels*; of which I have forbore to give any draught, it being easily conceived from the manner of the *Cockles* thus heaped together in the two former cuts.

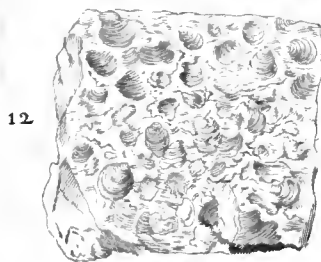
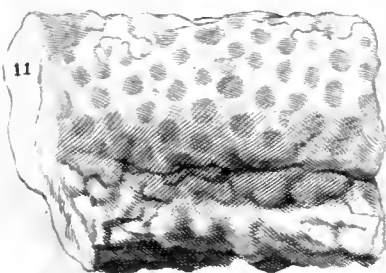
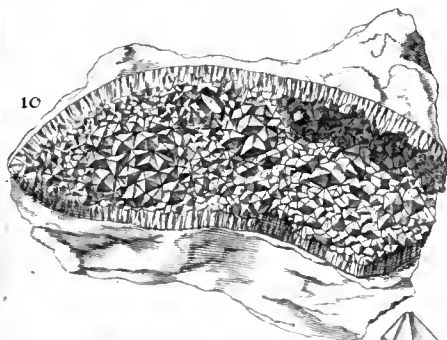
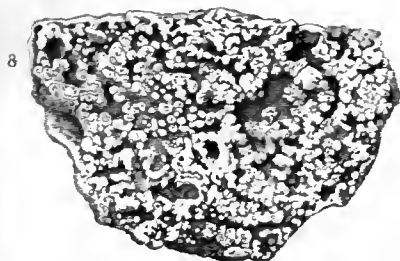
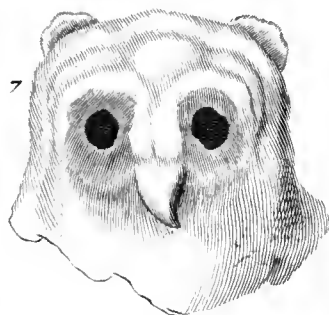
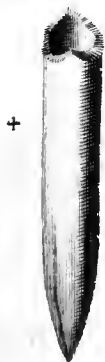
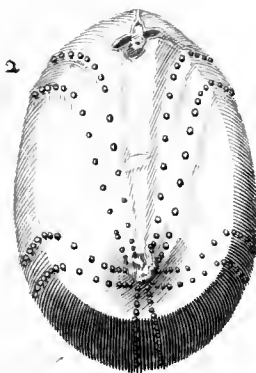
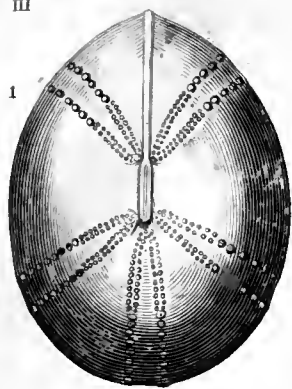
61. To these succeed the *stones* resembling *Sea-fish* of the *testaceous* kind, not found in *clusters* after the manner of the former, but in a separate state: of these there are some curiously lineated, and others plain, with but few or no such ornaments, which yet I must treat of promiscuously together, because there are of both sorts in several *species*.

62. Of these again some are of a *turbinated* form, and others *bivalvular*, resembling the double shell'd kind, joyned together with a hinge, and yet these sometimes found all with their shells apart, and sometimes again none of them so.

63. Amongst these the *turbinated* or *wreathed* kind of *stones*, by the *Greeks* called *Strombites*, from *στρίψω torqueo*, to wreath (which is always *helically*, and for the most part from the right hand to the left, and *spirally* from a greater to a smaller ending) are but seldom found: However, I have met with both the sorts of *Agricola*^g, the greater, which he says is sometimes nine inches long, but ours indeed not much exceeding five, of a plain *superficies*, as in *Tab. 4. Fig. 1* *. and the lesser wanting of half an inch in length, but curiously striated, as *Fig. 2*. both found in the Quarries in the Parish of *Heddington*, of a cinereous colour, somewhat inclining to yellow, and of a harder consistence than the stone wherein they lye.

64. But as for such as represent the *bivalvular Conchæ*, such as *Cockles*, *Escallops*, *Oysters*, &c. we have very great plenty, as well of kinds as individuals. The *Conchites* or Cockle-stones found in this County, may also be divided into the greater and lesser; whereof the greater are some of them striated with large *striæ*,

^g De Natura Fossilium, lib. 7. * Vid. Buccinum lapideum læve Fabii Columnæ, Aquatiliū & terrestr. observ. cap. 22.



Michael Burghers Delin: et Sculp:

and larger *furrows*, descending as it were from a *center* at the top, and expanding themselves to the *rim* of the stone ; having also six or seven *transverse simple lines*, bent circularly to the hinge or commissure of the *valves*, as in *Tab. 4. Fig. 3.* which is a *stone* without, of a dark *cinereous* colour, but within, a *black flint* ; found somewhere in the *Chiltern* about *Henly* upon *Thames*, and kindly bestowed on me by the ingenious Mr. *Munday*, Physitian there.

65. Some there are again, whose *friae* also descend from the hinge or commissure, but not in straight lines, but bent and undulated, and much broader than the former, as in *Tab. 4. Fig. 4.* which though in magnitude it fall short of the *Concha Tridacna* of *Aldrovandus* (so called it seems because they made three mouthfuls apiece) yet in form it shews to be so very like, as may be seen also in *Jonston, Tab. 13.* that were it not a *stone*, I must pronounce it the same^h. This I found at *Great Rolwright* in a bluish clay, whereof, and of nothing else, it seems to be concreted ; for it do's not much exceed it in hardness, and still participates most of that colour, though covered with a bright and shining substance, by the Naturalists called *Hoplites*, or *Armatura* : of which more anon when I come to *Cornu Ammonius*, a stone, the most of any adorned with that substance.

66. Another sort there is found at *Heddington Quarries*, whose lines or *friae* are not drawn like the two former, from the commissure of the *valves* to the *rim*, but transversly and circularly from one side of the stone to the other ; the lesser circles having place next the *commissure*, and the greater next to the *rim* of the stone, as in *Tab. 4. Fig. 5.* which seems much to resemble the *Concha rugata* of *Rondoletius*ⁱ, with *valves* swelling very high ; of colour it is cinereous, inclining to yellow, not hollow within, but a solid stone, and of much the same texture with the rubble of the Quarry.

67. Of the smaller *Conchites* there are also several sorts, differing in colour, *lineation* and *valves* ; for at *Teynton* and about *Burford*, where they are found in the Fields, they are most of them yellow, with their *valves* rising high and approaching to a round* : but at *Glympton*, where they are only found in a spring that rises

^h Vid. *Concham imbricatam minimam Aldrovandi. de Test. lib. 3. cap. 43.* ⁱ *Rondoletius de testaceis, lib. 8. cap. 25.* * These made red hot and put into drink, are accounted in this Country a present remedy for a stitch.

in a Wood about a mile Southward from the Church, they are much more depressed and of a *cinereous* colour; but both having their lineations from the *commiffure* to the *rim*, they are both therefore represented under one draught, *Tab. 4. Fig. 6.*

68. How it should come about that these *Cockle-stones* of *Glympton* should only be found at the Fountain-head, and no where lower in the stream, nor that I could hear of, in the Fields about, I must acknowledg to be a knot not easily loosed. Some have thought them brought out from amongst the Rocks, at the bottom of the hill where the Spring rises; others that they are formed by a peculiar virtue of the water, as it runs over the rubble stones that lye near its *exit*: for, say they, if you pick them never so clean away, in few months time you shall have as many more. And indeed it must be confest, that I met with several that were only striated on one side, and rubble stone on the other; and some of them but just begun to be a little lineated: However it be, I shall determine nothing yet, having imployed a careful and ingenious person to watch the increase and lineations of these *stones*, which when thoroughly understood, shall be faithfully communicated.

69. Beside those of *Glympton*, there are others at *Cornwell*, in the Park of the Right Worshipful Sir *Thomas Pennyston*, found in a bank of yellowish clay, of a much different form; and transversly striated, as in *Tab. 4. Fig. 7.* which though indeed for the most part are hard stones, yet I was shewed several by the Ingenious *Owner* of the place, that were nothing but clay, not differing at all from that in the bed wherein they lye, and out of which they seem to be formed, but in *figure* only; which is also different from all the *bivalvular Conchæ* that I find in Books, or have seen in collections of that sort of Shell-fish.

70. And so is the figure of the *Conchites* found in *Hornton* Quarry, near approaching to an oval, and scarce striated at all; which inclines me at least to doubt, if not certainly to conclude, that these *Cockle-like stones* were never heretofore any real *Cockle-shells*, thus transmuted by the penetrating force of petrifying juices, but that most of them (as the ingenious Mr. *Lister*^{*} thinks) ever were, as they now are, *Lapides sui generis*, differing not only from one another, but many of them from any thing in Nature

* *Philosoph. Transact. Numb. 76.*

beside, that the fresh or salt-water can any where afford us. But before I engage in this great controversie, let us first consider a few more of these stones resembling *shell-fish*.

71. And first, the above-mention'd *Conchites* found in *Horn-ton* quarry, and represented in *Tab. 4. Fig. 8.* which is not a solid stone within (as all the *Cockle-stones* hitherto described have been) but hollow, and filled with *spar*; sometimes shot into irregular figures, but for the most part forked, as in *Fig. 9.* the *basis*, or place where the branches of the fork are conjoyned, being rooted (in all that I have yet seen) at the *commisfure* or hinge of the *valves*, and the branches extending themselves in the broader parts of the *Conchites*; of which operation of Nature I can give no other account, but that it was first observed, by the Reverend and Ingenious Mr. *Clark*, Rector of *Dreyton* near *Banbury*, from whom, beside other favors, I received many of them.

72. After the *bivalvular Cockles* found always with their *valves* closed together, come we next to consider the other *Bivalves* found never so, but their *valves* always apart. And such are the stones resembling *Escallops*, and some other striated *Conchylia*: whereof that represented *Fig. 10.* is the most curious in its kind I ever yet saw, found in *Heddington* quarries by Mr. *Richard Stapley*, an ingenious young Man, and learned in these matters, to whom I am beholding not only for this, but for some other choice stones hereafter to be mention'd. Which amongst all the *Pectines* or *Escallop-shells* I could find in the *Icthyographers*, best resembles the *Pecten asper* of *Aldrovandus*¹. Of colour it is yellowish, eared on both sides, the lineations from the *commisfure* to the *rim* of the stone very prominent, and yet having some other *transverse* lines (not bending to, but from the *commisfure*) standing upon them, and not passing through the deep furrows so as to joyn with each other,

73. As the *transverse* lines do in the next following *Pectinites*, *Fig. 11.* where they are both of equal depth, and very small, thick and fine; the *transverse* lines all of them bent to the *commisfure*, but the other *striae* not meeting together in it, as in the former and following *Escallops*: This stone is of a light reddish colour, eared on both sides, and found in the quarries in the parish of *Heddington*.

¹ *De Testaceis, lib. 3. cap. 69.*

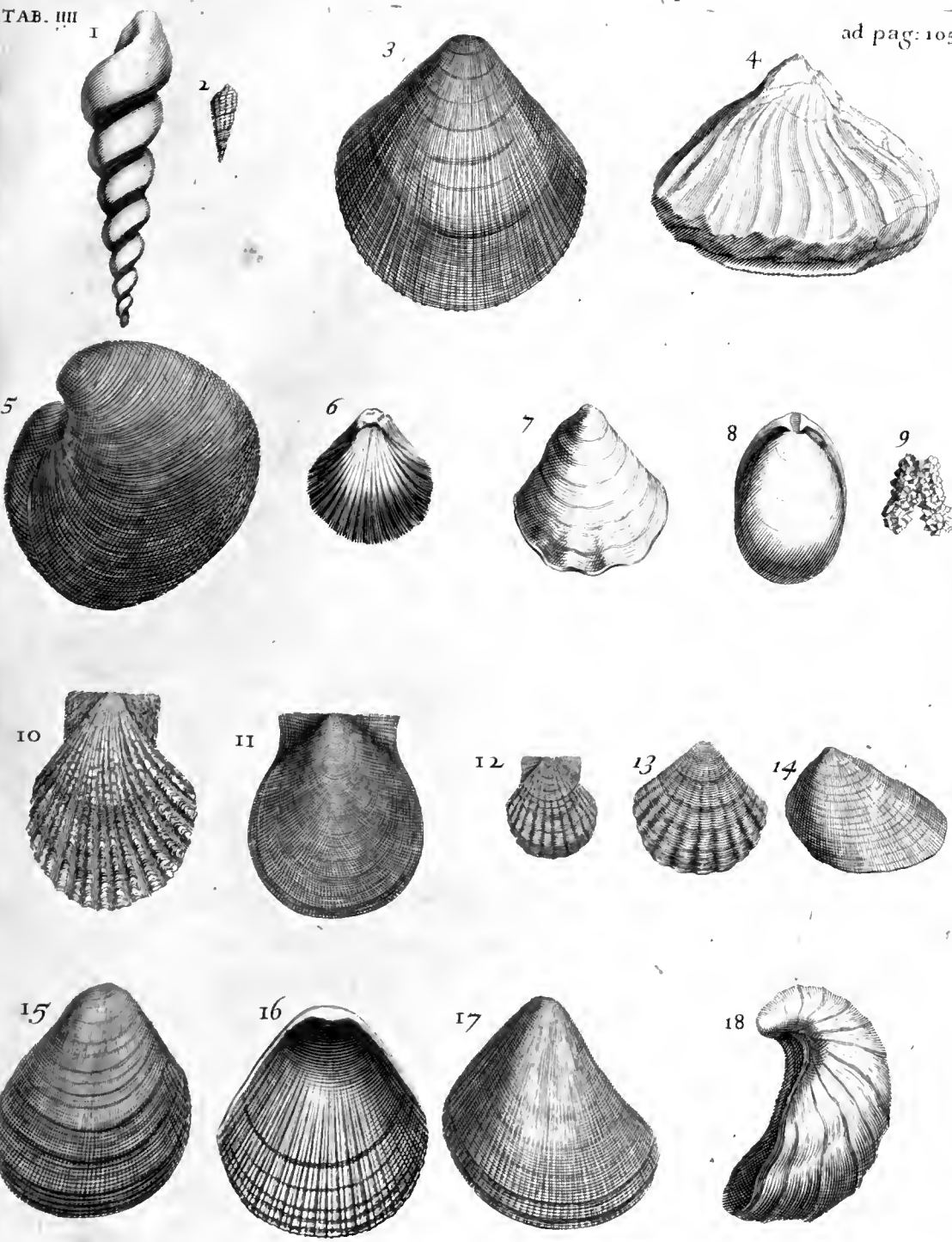
74. And so was the next *stone* in form of a *Pectunculus*, or little *Escallop*, *Fig. 12.* of a whitish yellow colour, the *striae* large and broad, but the *transverse* lines small, eared like the former on both sides: Which also argues, that this stone was never heretofore the shell of a Fish, and thus cast into stone by an *Animal* mold. For the *Pectunculi*, says *Rondeletius*^m, are a distinct *species* from the *Pectines* or larger *Escallops*, and never have ears but on one side, which indifferently are either on the right or left; except that we shall say that this was once the shell of a young *Pecten*, not yet come to its full growth.

75. To this also may be referr'd another of the same texture, only somewhat bigger, and wanting the *ears* of a *Pectunculites*, or little *Escallop-stone*, *Fig. 13.* which because it shews no signs of its *ears* being broken off, I suppose may either represent the *Chama striata Pectiniformis* of *Aldrovandus*ⁿ, or else the *Pectunculus* of *Bellonius*, which (as quoted by the *Zoographer Gesner*^o) he not only says has no ears, but has exhibited it in Sculpture.

76. And so perhaps may the next *stone*, *Fig. 14.* except we shall rather make it the first of the *Conchites striati*, or streaked *Cockle stones*, which indeed I cannot chuse but assent too, because of its bearing too much on one side, which I find the *Pectinites* or *Escallop stones* do not: and because it cannot be a *Tellinites*, which shell-fish (if at all) is never streaked that way. Let it therefore pass only for a streaked *Cockle stone*, which are plentifully found not only at *Heddington*, and about *Shot-over*, but in the Quarries near *Stunsfield*, *North Leigh*, and *Little Milton*; and are placed here, because found like the *Escallop stones*, always with their shells apart.

77. Whereof there are some larger, and as it were heaped upon one another, as in *Tab. 4. Fig. 15*; and others single, as in *Fig. 17.* The real *shell-fish* of which kind, called *Conchyliia striata*, though thus lineated without, are always, says *Aldrovandus*^p, plain and smooth within, contrary to what we find in these *Conchites striati*, as is shewn by *Fig. 16.* which shews the in-side of one of those stones, not only lineated from the *commiffure* to the *rim*, but adorned also with four or five *transverse fillets*, not made of one, but several conjoyned *lines*, which seems also to conclude

^m De Testaceis, lib. 1. cap. 16. ⁿ De Testaceis, lib. 3. cap. 69. ^o De Aquatil. lib. 4. p. 813. ^p De Testaceis, lib. 3. cap. 44.



it to be *Lapis sui generis*, and not to have been molded by a striated *Cockel-shell*.

78. Beside *Cockle* and *Escallop-Stones*, there are others that seem to be of the *Oyster* kind, found plentifully in the Gravel-pits without *St. Clements*, in *Cowley-common*, and in a wood near *Wood-eaton*: amongst them there are some of an *oblong figure*, very thick, and of a bluish colour, such as that depicted *Fig. 18.* which I guess may be the same with the petrified *Concha oblonga crassa*, mentioned by *Dr. Merret*^a, found in *Worcester-shire*, and there called *Crow-stones*, *Crow-cups*, or *Egg-stones*; or else the more protuberant part of the *Mytulus niger* of *Aldrovandus*^r, or the *Mytulus* of *Rondeletius*^s.

79. But others are again of the true *Oyster shape*, called *Ostracites*, or λιδοστέρον, represented *Fig. 19.* some whereof are *blue*, and others *reddish*, of the colour of the Gravel out of which they are taken: These are generally greater, thicker and weightier, than the true *Oyster-shell*, yet like them seem to be resolved, according to the opinion of *Steno*^t, into many *little shells*, the innermost being always the *greatest*, and the outermost the *least*: Upon which very account I could easily have assented, that these, and the former, might once indeed have been *shell fish*; but that we only find (just as in the *Escallops*) the *protuberant* parts of the *shells*, and never any of the *flat ones*; which had they been once *fishes*, we have little reason to think, could have been thus absent from them.

80. We find also in *Oxford-shire* a sort of *Mytuloides*, or *Muscle-stones*, of an odd kind of figure, and not easie perhaps to be parallel'd, though the *testaceous Kingdom* be of large extent: They are not hollow, but within a *terra lapidosa* of a yellowish colour, and cover'd without with a white shining kind of *Armature*, with *ablong lineations* agreeable to the figure of the *stone*, as in *Tab. 5. Fig. 1.* found in digging a Well in the Parish of *Cleydon*. To which we may add another sort remarkably small, found in *Heddington Quarries*, *Fig. 2.* which finish my discourse concerning such *stones* as resemble the στεφανόδερμα, or *testaceous shell-fish*. Whence I proceed

81. To *stones* representing the μαλακόδερμα, or the *shell-fish* of

^a *Pinax rerum Natur. Brit.* p. 216. ^r *De Testaceis, lib. 3. cap. 71.* ^t *De Testaceis, lib. 1. cap. 46.* ^s *In Prodromi vers. Angl.* p. 75, 76.

the softer *crustaceous* kind, such as that *Tab. 5. Fig. 3.* in substance and hardness much like a *Pebble*, and of colour *yellowish*: divided first by five pretty straight *lines*, adorned on each side with double sets of *points*, ascending from a *protuberant umbilicus* in the *basis* of the *stone*, to another of like form at the top, but *foliated* round in manner of a *Rose*: And after again subdivided by five other *indented lines*, terminated before they reach the *umbilici*; by which means the spaces between these lines are all *pentagons*, like the outer scales of some sort of *Tortoise*. Much such another *stone* as this I find in *Aldrovandus*, in his Book *De Testaceis*^u, which because he thought resembled the *sea Urchin* deprived of its outward prickly coat, he calls *Echinus lapis spoliatus à suis spinis*: But it seeming to me to be much more like the *Estrice marino*, *si ritrava nelli mari profondi*, of *Ferrante Imperato*^w, I chuse rather to call it *Histicites*, or *Porcupine-stone* without bristles. This was found in the *Chiltern* Country, near *Stonor-house*, and sent me by the Worshipful *Tho. Stonor Esq*; the Proprietor of the place, and one of the *Noblest Encouragers* of this Design.

82. And so was the following curiously embroider'd *stone*, *Fig. 4.* much resembling the petrified *Riccio marino*, or *sea Urchin* of *Imperatus*^x, found in the same place also without *prickles*, but much differing from the former in colour and substance, as also from the *stone* of that Learned Author: For whereas he confesses that was but of the consistence of the *Lime-stone*; ours, though without of a *whitish cinereous* colour, within is a hard *black flint*, covered over with thin glittering plates, set edg-ways to the ball of the flint, out of which those uniform *eminencies* and *depressions*, those *waved* and *transverse lineations* are all framed.

83. These are found in great plenty in the Isle of *Malta*, and by the Country men there, says the Ingenious *Boccone*^y, called *Mamelles de Saint Paul*, because of the lenticular *eminencies* and small *roundures*, that fill the whole surface of the *stone*; or rather because they are sometimes found coupled two and two, as may be seen in the *sculptures* of the same *Author*. By *Boetius* and *Gesner*, and all the old *Authors*, they are called *Ova anguina*, *Serpents eggs*; perchance because from the *basis* there issue as it

^u De Testaceis lib. 3. cap. 40. ^w Dell' Hist. Naturale, lib. 28. cap. 1. ^x Dell' Hist. Naturale, lib. 24. c. 26. ^y Recherches & observations Naturelles: Lettre vingt sixieme.

were five *tails* of *serpents*, waved and attenuated toward the upper part of the *stones*. They tell us also a story of its being engendered from the *salivation* and *slime* of *snakes*, and cast into the Air by the force of their *sibilations*, where if taken, has effects as wonderful as its generation, and therefore of great esteem amongst the *French Druids*. But I care not to spend my time in *Romance*, and therefore proceed

84. To another *Echinites*, resembling the inner shell of the *Echinus ovarius* or *Esculentus*, so called from a sort of *quinquepartite* or *stellated eggs*, that this kind of *Echinus* has within it good to eat. Their outermost coat is full of *sharp prickles*, upon which account they are sometimes called *Chastaignes de Mer*, or *sea Chesnuts*, because of their likeness to rough prickles that encompass Chesnuts whilst they are on the Tree; for which very reason they are also called *Herissons de Mer*, *sea Hedg-hogs*, and *Cardui Marini*, *sea Thistles*: which rough coat of theirs, when the Fish is dead, coming off from them, they then discover their *inward shell* of that *curious workmanship*, that is lively represented by our *stone*, *Fig. 5.* made up of so many *compartements* and *eminencies*, and so regularly disposed, that, says *Monsieur de Rochefort*² (who calls them also *Pommes de Mer*, or *sea Apples*) the most ingenious *Embroiderer* would be much troubled to imitate them. This *Echinites ovarius* was found in the Parish of *Teynton*, and sent me by my worthy and ingenious Friend Mr. *Robert Veysey*, to whom also I am beholding for many other matters mentioned in this *Essay*.

85. From *Teynton* also was sent me another of this kind, but much smaller, not exceeding the *Rouncival pea*, or *French Halset* in bigness; and yet with lines of *compartement*, and other *eminencies* as large as the former, but much fewer in number: to which, whether there be any *Animal* in Nature whose *shell* will exactly, or for the most part correspond, I much question; wherefore that it may be examined both at home and abroad, I have caused it to be engraven, *Fig. 6.*

86. To which add a *fourth* sort with its *prickles* still on, found plentifully in the Quarries near *Shotover-hill*, very like to the *fifth* sort of *Echinus* of *Aristotle*, as depicted by *Rondeletius*³, whose *inward shell* it seems is very small, but its *prickles* long and stub-

² History of the *Iles Antilles*, or *Caribby Islands*, chap. 19. art. 13. ³ *De Piscibus*, lib. 18. cap. 33.

born, found always in the deepest waters, and sticking to Rocks, much after the same manner as here represented in stone, *Fig. 7.* which in conformity to *Aristotle* may be called *Echinites minutus*. And this had ended my Discourse of Stones resembling *Shell-fish* of the *crustaceous* kind, but that I am admonish'd by the Learned, and deservedly Famous *Virtuosi*, Mr. *Hook*^b and Mr. *Ray*^c, and since them by the Ingenious *Sicilian Gentleman Monsieur Boccone*^d,

87. That the stone commonly stiled *Cornu Ammonis*, also belongs to this place, as being nothing else but the petrified shell of the *Nautilus*, or *Coquille de Porcelain*; or as *Rondeletius*^e calls it, the *testaceous Polypus*. Of these we find plenty in the County of *Oxford*, of different colours, figures, sizes, but all so curled up within themselves, that the place of the head is always in the circumference and the tail in the center of the stone, and therefore by the Ancients called *Cornua Ammonis*, for that they resembled the curled horns of the *Ram*, worshipp'd by the name of *Jupiter Ammon* in the desarts of *Africa*^f; to whom *Alexander the Great* having declared himself Son, that he might be the more like so inhuman a Father, he assumed the horns of the *Ram Deity*, as may be seen on the Impresses of some of his Money. And so did *Lyfimachus* that succeeded him in *Thrace*^g, *Attila the Hun*, and some other proud Princes.

88. The places in this County most remarkable for this stone, are 1. The City of *Oxford* it self, where, in digging cellars, foundations, &c. chiefly in the eastern parts of it, they are commonly met with; whereof some are small, the parts protuberant, and swelling to a round, as in *Tab. 5. Fig. 8.* others broader and more depressed, as in *Fig. 9.* but the lineations of both waved, and extended from toward the center, to a single edged ridge in the back of the stone: and therein different from a third sort found also at *Oxford*, whose lineations are larger, not so thick nor waved, and terminated at great protuberances on each side of the stone, between which, on the broad back of it, there intercede other lineations, the whole body of the stone being also divided by Sutures, in form much resembling the leaves of *Oak*, as in *Fig. 10.* The two latter of these are both perforated at the center, and there-

^b Micograph. Observ. 17. ^c Observations Topograph. p. 123. ^d Recherches & Observations Naturelles, Lettre 28. ^e De Piscibus, lib. 17. cap. 9. ^f Quint. Curtii de reb. Gest. Alexandri, Histor. lib. 4. ^g See the Cabinet in the Bodleian Library.

fore called by *Baubinus*^h, *Cornua Ammonis pertusa*: And all three adorned with a shining brazen *Armature*, in luster equalling that *metal* it self, yet of which in substance it has nothing less, though *Agricola* have affirmed it to be *naturæ rudimentum id metallum facere discentis*.

89. *Boetius de Boot*, in his Book *de Lapidibus & Gemmis*ⁱ, thinks the *stone* it self naturally of a *ferrugineous* colour, which lying in an Earth sated with an *aluminous* juice, is changed thereby into this *brazen* colour. To which *de Laet*^k in his Supplement, adds, *atramentum sutorium*; both which, he says, joined, give that colour to *Iron*. For my part, I rather think it may be performed by *Nature*, much after the same manner they guild *money* at our *English Baths*; if so, there will be requisite something *urinous*, which they always add *there* to superinduce such a colour, whereof more at large when I come into *Somerset-shire*.

90. The second place eminent for production of these *Stones*, is the Parish of *Cleydon*, where they find them of many more *turns* than those at *Oxford*, though not much bigger; without *Armature*, of a *yellowish* colour (like the *Asteriæ* before mention'd found at the same place) and differently *striated*, as in *Fig. 11.* in which the *striæ* from the innermost part of the *stone* are all single, but many of them divided before they reach the *rim* of it, where they are terminated with a back much more *protuberant* than the rest of the *stone*, but alike *striated*.

91. Near *Thame*, in the Fields Eastward from the *Church*, they sometimes meet also with the *Cornu Ammonis*, *striated* singly like the former, near the inner part of the *stone*, and presently dividing, but without *termination* either at any *ridge*, or other *protuberancies* in the back; the division being continued to the other side of the *stone*, where 'tis made again into one common *lineation*, as in *Fig. 12.* Of which sort I had some *arches* or parts sent me also from *Chislehampton*, by the Right Worshipful Sir *John D'Oyly* Baronet, in whom flourish all the *Virtues* of that ancient *House*. But these (not like the former) a hard *stone*, but some of them a kind of *Terra lapidosa*, or hardened yellow *clay*, one degree perhaps above that of the bed wherein they lay; which (beside Sir *Thomas Pennystons* clay *Cockles*) seem to overthrow

^h *Joann. Baubinus de Lapidibus variis in fine Hist. admirabilis fontis Bollenfis.* ⁱ *Cap. 246.* ^k *De Lapid. & Gemmis, cap. 22.*

Steno's¹ first conjecture concerning these matters: *That they are always found in the same place, of the same consistence; and that there are no signs amongst them of sooner or later production.*

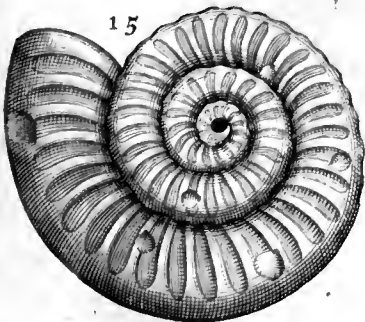
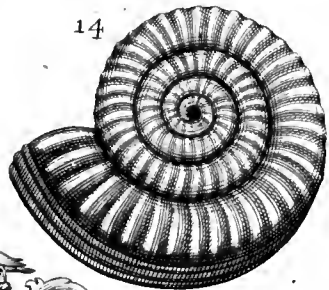
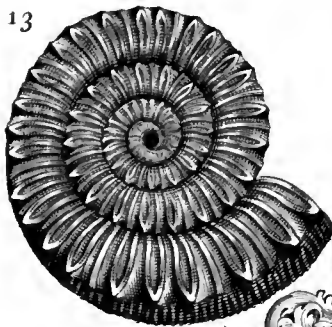
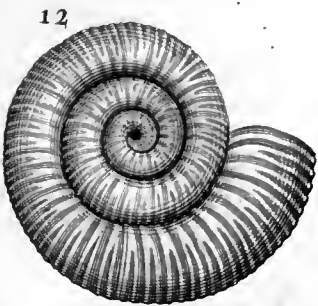
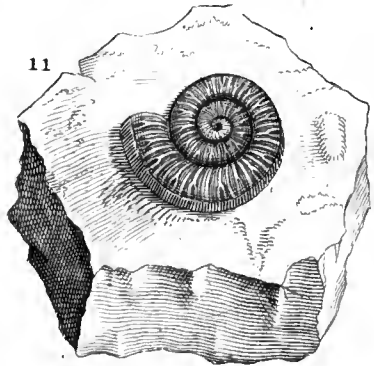
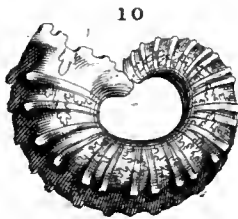
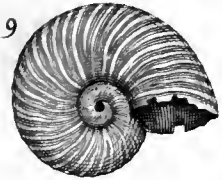
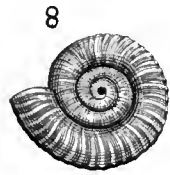
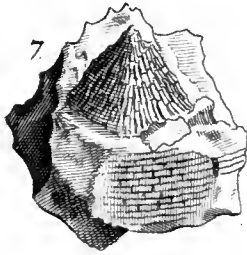
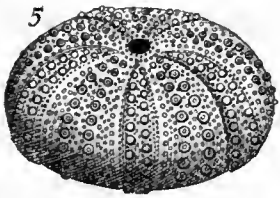
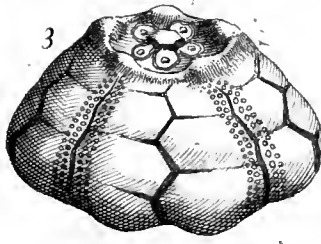
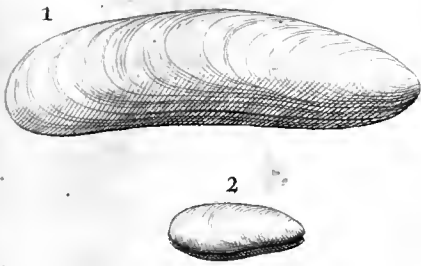
92. And so do the *Ophiomorphit*'s found in a bluish clay in the Parish of Great Rolwright, Eastward from the Church, whereof some are so soft, that 'tis easie to press them asunder with ones fingers; and others a hard *bluish stone*. But though they agree with the former in the manner of *production*, they differ as much in the manner of their *lineations*, for whereas their *striae* were divided near the rim, some of the *lineations* of these come together there, and are united in pretty large *protuberant knobs* on each side the back of the stone, which in these being broad and somewhat rising, is crossed by other *arched* lines that intercede the *eminencies*, as in *Fig. 13.*

93. Other *Ophiomorphit*'s there are, that have only straight *ribs*, which terminate also in straight *ridges* that run along on each side the back of the stone; between which two *ridges*, there rises a *third* more prominent one, just in place as it were of the *Spina dorsalis*, as in *Tab. 5. Fig. 14.* which though not wreathed, but plain like the other lower *ridges* on each hand it, I take to be the *Cornu Ammonis cristatum* of *Johannes Bauhinus*^m. One of these, of about four inches over, and made up of as many *turns*, was given me by the Reverend and Learned Dr. *John Wallis*; and there is another amongst the *Κεφάλια* of the *Medicin School*, of above eight inches *diameter*, taken up as they say somewhere about *Corpus Christi College*.

94. There are also *Orphiomorphit*'s found somtimes about *Adderbury*, about two miles from *Banbury*, but so very seldom, that though I were there often, I could meet with none of them; so that I cannot inform the *Reader* whether they are of any peculiar kind, different from what have been already describ'd, or no: However, that the *Town* has not its name from these stones (as Mr. *Ray* thinks) I dare confidently avouch, *Adderbury* being only the vulgar name: for in the *Court Rolls* of *New College*, (and o-ther *Instruments*) to which the *Lordship* of the *Town* belongs, it is written *Eabberbury*, perhaps from *St. Ebba* the tutelar Saint of the *Church*.

95. The biggest of the kind that I have yet met with, was at

¹ In t' actatu de *Caris Carchariae dissecto capite*, p. 118. ^m *Johannes Bauhinus de Lapidibus variis in fine Hist. admirabilis fontis*, Bollenfis p. 20.



11. List
Tit. 5.



Clifton near *Dorchester*, but found as I was told at *Sandford* near *Oxford*, about eleven inches over, and seventeen pounds in weight; having single *ribs* only, without knobs or ridges at the back, which is plain and even, as in *Fig. 15.* which though little more than half so big as that mention'd by *Dr. Merret* of 21 inches diameter *, that he saw in the Garden of one *Mr. Rawdon*, yet I guess it must needs so extravagantly exceed the biggest *Nautilus* or *Porcellane-shell*, both in latitude and number of turns, that we must be forced to seek out another origin for it.

96. Beside, its being in-laid with a small sort of *Conchites*, so placed in its sides, that they have segments (if I may so call them) within the very bulk or body of the *Ophiomorphite*, seems flatly to deny its original from the *Nautilus*, for had this fallen out by compression of their shells together, their uniform figures must needs have been spoiled, contrary to what appears as well in the stone as its draught. Which brings me to consider the great Question now so much controverted in the World.

Whether the stones we find in the forms of Shell-fish, be Lapides sui generis, naturally produced by some extraordinary plastic virtue latent in the Earth or Quarries where they are found? Or whether they rather owe their form and figuration to the shells of the Fishes they represent, brought to the places where they are now found by a Deluge, Earth-quake, or some other such means, and there being filled with mud, clay, and petrifying juices, have in tract of time been turned into stones, as we now find them, still retaining the same shape in the whole, with the same lineations, futures, eminencies, cavities, orifices, points, that they had whilst they were shells?

97. In the handling whereof, though I intend not any peremptory decision, but a friendly debate; yet having according to the wishes and advice of those Eminent *Virtuosi*, *Mr. Hook* and *Mr. Ray*, made some considerable collections of these kind of things, and observed many particulars and circumstances concerning them: Upon mature deliberation, I must confess I am inclined rather to the opinion of *Mr. Lister*, that they are *Lapides*

* *Pinax rerum Naturalium*, p. 215. There is another about that bigness in the Repository of the Royal Society, given by the Right Honorable Henry Earl of Norwich, Earl Marshal of England.

sui generis; than to theirs, *That they are thus formed in an Animal mold.* The latter opinion appearing at present to be pressed with far more, and more insuperable difficulties than the former.

98. For they that hold *these Stones* were thus formed in the *shells* of *fishes*, must suppose either with *Steno*ⁿ, that they were brought hither by the *Deluge* in the days of *Noah*; or by some other more particular, and perhaps *National Flood*, such as the *Ogygean*, or *Deucalionian* in *Greece*, than either of which there is nothing more improbable.

99. First, not by the Flood in the days of *Noah*, because that (and for very good reasons too) seems not to have been *universal*, and at most to have covered only the *continent* of *Asia*^o, and not to have extended it self to this then uninhabited *Western* part of the World. But suppose it were *universal*, yet it proceeded from *Rain*, which (as *Mr. Ray* well observes) would more likely have carried *shells* down into the *sea*, than brought any upwards from it. And if it be further urged, *That the fountains of the great deep were broken up*^p, and that the *Deluge* proceeded partly from a *breaking forth* and over-flowing of the *sea*, which consequently might bring in the *shells*: It may be answered, that the over-flowing, either *gradually* increased upon the Earth, or was *violent*: if *gradually*, as it is most likely (for God caused not any *wind* to pass over the *Earth* till the *Waters* began to assuage^q; and besides, the *Waters* that descended in *Rain*, in all probability at first ran down to the *Sea*, and gave some check to its *floods*) why should we think that any *shell-fish*, especially of the *testaceous* kind, whereof there are some that always stick to *rocks*, and others that have no locomotion, as *Oysters*, *Muscles*, &c. but what is given them by the *Waters* violence, should leave their beds in the *Sea* at all, and be carried aloft to the tops of *Mountains*. And if *violent*, then such a Flood would have indifferently scattered all sorts of *shells* over the whole face of the *Earth*, especially in all *valleys*; whereas we find the *stones* that resemble them many times at the tops of *hills*, and but in few *valleys*; and those not scattered neither indifferently one amongst another, but for the most part those of a *kind* together; and of the same *kind* too, those of different *lineations* together. Thus at *Cornwell*

ⁿ *In Prodrômio.* • *Vide Stillingfleeti Origines Sacras, lib. 3. cap. 4.* ^p *Gen. c. 7. ver. 11.* ^q *Gen. cap. 8. ver. 1.*

and *Hornton* we find only *Conchites* or *Cockle-stones*, and those *striated* (if at all) from side to side *transversely*, as in *Tab. 4. Fig. 7, 8.* And so at *Glympton* only *Cockle-stones*, but lineated the contrary way from the *commiffure* to the *rim*, as in *Fig. 6.* of the same *Tab.* On *Cowley-common* we find nothing but *Ostracites*, such as in *Tab. 4. Fig. 19.* And in the *Gravel-pits* of *St. Clements* a mixture of such *Oyster-stones*, and (to which I believe it will be hard to adapt a *shell-fish*) the stone *Belemnites.* The *Nephiri* or *Lapis Megaricus* at *Langley*, is a bed of nothing but *Cockles* as small as pease; and that at *Charlton* the same, only the *Cockles* are somewhat bigger. So that these beds of *Cockle-stones* (if they must needs have been *shell-fish*) seem rather to have been their breeding places, where they had aboad for some considerable time (especially where we find them of several sizes) than brought hither in the *flood* in the time of *Noah*, which remained on the Earth but *forty natural days*, too small a time for so many *shell-fish*, so dispersed, as they must be presumed to be by so violent a motion, to get together and sequester themselves from all other company, and set them down, *each sort*, in a convenient station.

100. And secondly, that they should be brought by any other *flood* is altogether as unlikely; since we have no other *floods* deliver'd down to us, but the *Ogygian* and *Deucalionian*, which were restrained within *Greece.* But suppose all that can be desired by the *adverse* party, that there was sometime or other a *National flood* here in *England*, that did for some hundreds of years cover the face of the Land, of which there is no Record deliver'd to posterity; yet that it should cover the highest Hills, or if it did, that it should force the *shells* to their tops, which are weighty and rather affect the lowest places, is a concession as hard to be granted, as that the Mountains (where such stones as resemble them are now found) were heretofore low places and since raised by *Earth-quakes*: a thing by no means to be believed of our *Northern* parts, where the *Earth-quakes* we have at any time are so inconsiderable, that they scarce sometimes are perceived, much less affrighten us; unless we shall groundlessly grant, that in the infancy of the *World* the *Earth* suffered more concussions, and consequently more mutations in its *superficies*, than it has done ever since the Records of time.

101. Yet granting too that in the *Primitive Times* there were such strange *Earthquakes*, or else that there was some time or other such a *Flood*, that did cover our *highest hills*, and which might be so *violent*, as to bring *shells* out of the *great deep*, and place them on the *tops* of *Mountains*; yet that our *formed stones*, at least the most of them, were not fashion'd in such *molds*, but are *Lapides sui generis*, may be strongly suspected from the following *reasons*.

102. First, because I have found some of them that resemble *shell-fish* that always stick to *rocks*, and cannot well be presumed to have come away with the greatest *Flood*, unless so *violent* as to have brought the *Rocks* too: and such is that *engraven Tab. 5. Fig. 7.* which whether it best represent the *Echinus quintus* of *Aristotle*, or some sort of *Lepas* or *Patella*, equally makes for my purpose, neither of them leaving the *rock* they stick too, being *Univalves*, and having the *rock* it self instead of the *other*.

103. Secondly, because there are many *shells*, and other *testaceous* and *bony substances* belonging to *Fish*, that must also have been left behind upon the *ebb* of such a *Flood* as well as the *rest*, of which we have no stones that resemble them at all. Such are the bones of *Whales*, *Sea-horses*, and the bones of all the *squammeous* kind; the great *shells* of the *Buccina*, *Murices*, *Conchæ Veneris*, and *Solenes*; the sword of the *Xiphias* or *Sword-fish*, and almost all the *crustaceous* kind, such as *Crabs*, *Congers*, *Lobsters*, &c. which last having *locomotion*, I should much rather expected to have found *petrified* on the tops of *Mountains*, than any of the *testaceous* kind, and yet of *these* we meet the fewest of any.

104. Thirdly, because there are many Stones formed indeed in the manner of *Bivalves*, &c. which yet resemble no species of *shell-fish* now to be found, whereof several are above-mention'd. And this is ingeniously confess'd by *Fabius Columna*^r, though one of the Adversaries of this my present *opinion*: *Addemus* (says he) *Pectunculorum imagines, quarum quasdam non nisi lapideas vidimus*, of which that he calls his *Mytulo-pectunculus rarior Berberoides*, is one. If it be said, that possibly these Species may be now lost, I shall leave it to the *Reader* to judge, whether it be likely that *Providence* which took so much care to secure the *works* of the *Creation* in *Noah's Flood*, should either then, or

since, have been so unmindful of some *shell-fish* (and of no other *Animals*) as to suffer any one *species* to be lost.

105. Fourthly, because there are several *formed stones*, that no body pretends to know whether to refer, as representing neither *Animals* or *Plants*, either in the whole or parts; such as the *Selenites*, *Astroites*, and *Belemnites*; which if thus *tacitly* confess to be *Lapides sui generis*, and formed by some latent *plastick power* of the *Earth*, why might it not as well produce all the rest? especially since scarce any of them are reduced to *Animals* or *Plants* without great inconvenience. Thus they that think the *Asteria* to be nothing but the *Spinæ dorsales*, or tail-bones of *fish* petrified (they consisting, 'tis true, for the most part of pieces sticking together like *Vertebræ*) neither can tell us of what sort of *Fish*, nor give us any reasonable account why the tail-bones of such a particular *Fish* (for the *Asteria* of all places are *striated* alike, and seem to have had original from the same *Species*) should be thus *petrified*, and not the tail-bones as well of some others?

106. And they that fancy the several *Species* of *Brontia* to be nothing else but the *petrified shells* of *Echini Spatagi*, or *Brissi*, would be hard put to it to reconcile the different conditions of that *shell-fish* and these stones: for first, the *Fish* it self is but rarely found, *πελάγιοι ἔσπανιοι*, says *Aristotle*^c, which is also confirmed by *Rondeletius*^t, whereas the Stones are plentiful enough. Again, the *Echinus Spatagus* has but few bristles, *aculeis parvis & raris septus*, says the same *Rondeletius*^u, and those, if we may believe the Cuts of Authors, but disorderly set; which how agreeable to our *Brontia*, *Tab. 2. and 3.* let any man judge. The first of them indeed in the gross Figure, is like the *Herissons Spatagi* of *Boccone*^w which he saw in *Holland*, flat like a *small cake*; but he tells us nothing of such numberless small *annulets* as there are in our Stones, which if heretofore the places of so many *bristles*, but ill agree with the description of *Rondeletius*. Beside these of *Oxford-shire*, there are several other sorts that I have seen in other Counties (hereafter to be represented, in case this *Essay* prove acceptable) which I could heartily wish the Ingenious *Steno* and *Boccone*, or any other *Curioso's*, for the better clearing of this great *Controversie*, would undertake to parallel (and so

^c *Hist. Animalium*, lib. 4. cap. 5. ^t *De Piscibus*, lib. 18. cap. 31. ^u *Loco citato*. ^w *Recherches & observations Naturelles* Lettre 26.

of other formed stones) with shells in all parts answerable.

107. They that think the *Cornua Ammonis*, or *Ophiomorphites*, to have been formerly nothing but *Porcellane-shells*, seem also to be pressed with the like difficulties: for either there are several sorts of them not known to (I am sure not described by) Authors, or else our stones must have their formation from a different mold than their shells. For first, the shells seem to be extravagantly broad at the mouth, as described by *Rondeletius* and *Jonston*, and not to have more than two other small turns at most; whereas the turns of the *Ophiomorphit's* are proportionable to one another, and in number many times four or five, and sometimes six, if we may believe *Aldrovandus**: Of which difference *Chioccus*† seems to have been so well aware in his description of the latter part of the *Museum Calceolarium*, that he makes the *Cornu Ammonis* and *Nautilus lapideus* to be quite different things, and describes the latter very broad at the greater end, and with but one turn, somewhat like indeed to the *Porcellane-shell*.

108. Beside, so far are some of our English *Ophiomorphit's* from ever having been formed by the shell of the *Nautilus*, that at *Huntley-Nab* in the *North-riding* of *York-shire*, they are found always included in other great round stones, not unlike, says *Mr. Cambden*‡, to Cannon bullets. And at *Whirby*, says *Mr. Ray*⁴, in stones of a *lenticular figure*, which if formerly they had been the shells of *Nautili*, how they should become thus included in stones also of a *determinate figure*, is a difficulty more insuperable than any of the former. Add hereunto that *Mr. Cambden*⁵, and since him *Dr. Childrey*⁶ plainly avouch, that the *Ophiomorphit's* of *Cain-sham*, have some of them beads, and that in this they differ from those of *York-shire*: *Vidimus enim lapidem hinc delatum serpentis in spiram revoluti effigie, cujus caput in circumferentia prominuit, extrema cauda centrum occupante*, are the very words of *Mr. Cambden*. Which if I find true when I come into *Somerset-shire*, will give me, and I doubt not, others satisfaction beyond all exception; for that the shells of the *Nautili* have any such matter, no body yet has, nor will dare to pretend.

109. To which also add the greatness of some of these stones, whereof there are some it seems near two^d foot in diameter, far

* *Museum Metallicum*, lib. 4. cap. 1. † *Museum Calceolarium*, sect. 3. p. 416. ‡ *Cambden* in *York-shire*.
 ⁴ *Topograph. Observat.* p. 114. ⁵ *Cambden* in *Somerset-shire*. ⁶ *Britannia Baconica* in *Somerset-shire*.
 ⁷ *Dr. Merret's Pinax rerum natural.* pag. 215.*

exceeding, says Mr. Ray ^e the bulk of any *shell-fish* now living in our *seas*. To which if it be said that most *petrifications* are made either by *aggregation*, or by intrusion or protrusion of *parts*, which always increase the bulk of the *subject*: It may be answered, that though such *augmentation* must be allowed indeed in many cases, yet sure it did not so fall out in the *petrification* of the *Nephiri* or *Cockle-stone* at *Langley*, where the *stones* are much less than most Natural *shells*.

110. Fifthly, because that even those *stones*, which so exactly represent some sort of *shell-fish*, as *Oysters*, *Cockles*, &c. that there can be no exception upon the account of *figure*, but that they might formerly have been shells indeed; at some places are found with only *one shell*, and not the *other*. Thus in *Cowley-common* we meet only with the *gibbous*, and not the *flat shell* of the petrified *Oyster*, and so of the *Escallop-stones* in the Quarries near *Shot-over*; which had they been once the shells of *Oysters* and *Escallops*, in all probability had scarce been thus parted.

111. Sixthly, because I can by no means satisfy my self, how it should come to pass, that in case these stones had once been molded in shells, some of the same kind should be found in beds, as the *Conchites* at *Langley*, *Charleton*, *Adderbury*, and *others*, scatter'd as at *Glympton* and *Teynton*; and so the *Ostracites* at *Shot-over* and *Cowley*. Nor how it should fall out, that some of these *Bivalvulars* should always be found with their shells apart, as the *Ostracites* and *Pectines*: and *others* always closed together, as the *Conchites* in all places I have yet seen.

112. Lastly, because many of these *formed stones* seem now to be in *feri*, as the *Selenites* at *Shot-over* and *Hampton-Gay*, the *Conchites* at *Glympton* and *Cornwell*, where within one of the *clay Cockles* above-mentioned, I found a little one of *stone*, not exceeding a *vetch* in bigness; which had they been formed heretofore by *Cockle-shells*, in all likelihood would both either have been *Stone* or *Clay*. Nor can it be said they were brought hither by different *Floods*, because they were both found in the same *bed*, one included in the other. Which is all I have to urge for this part of the *Question*, but that in the *Bishoprick* of *Hildesheim*, between *Alfeld* and *Eimbec*, there is a sort of *Ochre* that forms it self in this manner into the *shape* of *Oysters* ^f: And that Mr. Ray

^e Topograph. Observations, p. 127. ^f *Laekmundi* 'Ogurozeta. sect. 1: cap. 4.

was informed by a person of good credit, of a *stone* of this nature resembling a *Cockle-shell*, found in the belly of a *Beef*, where in all likelihood it bred, and shot into that *figure*: Which if true, says he, there can be no reason to doubt, but that those in the Quarries and other places are so generated.

113. But against this opinion there are several considerable *objections* brought by the ingenious Mr. *Hook*, *Steno* and *Boccone*, which I shall next faithfully propound to the best advantage, and then see whether they may not more easily be solved, than the *arguments* on the other side perhaps are like to be.

114. First, That amongst those *stones*, there are some with the perfect *shell*, in figure, colour and substance, sticking to their surface; especially, says Mr. *Hook*^e, (discoursing of these matters) *those* Serpentine or Helical stones were covered with, or retained the shining or pearl-colour'd substance of the inside of a shell, which substance on some parts of them was exceeding thin, and might be easily rubb'd off; on other parts it was pretty thick, and retained a white coat, or flaky substance on the top, just like the outsides of such shells; some of them had very large pieces of the shell, very plainly sticking on to them, which were easily broken or flaked off by degrees. Add hereunto some particulars mention'd by *Steno*^h. 1. That there was found a Pearl-bearing shell in Tuscany, a Pearl yet sticking to the shell. 2. A piece of the great Sea-nacre [*pinna marina*] in which the silk-like substance within the shell being consumed, the colour of that substance did remain in the earthy matter which had filled the shell. 3. That about the City of Volaterra, there are many beds of earth, not stony, which do abound with true Cockle-shells, that have suffer'd no change at all, and yet they must needs have lain there above 3000 years; whence it is evident, that that part of Tuscany was of old time cover'd with the Sea: And why then might not as well all those other places where these petrified shells are found? 4. To which also let me add, that at some places here in England, particularly at Cats-grove near Reading, a place sufficiently remote from the Sea (of which more at large when I come into Berk-shire) they meet with a bed of Oyster-shells both flat and gibbous, about 12 or 14 foot under ground, not at all petrified, all of them opened, except some very few, that I suppose have ca-

^e *Micrograph. Observ.* 17. ^h *In Prodromo.*

usually fallen together ; which how they should come there without a *Deluge*, seems a difficulty to most men not easily avoided.

115. To all which it may be answered, first in general with Mr. *Lister*ⁱ, that we will easily believe that along the shoars of most Countries, such as are particularly the shoars of the *British* and *Mediterranean Seas*, there may all manner of *Sea-shells* be found promiscuously included in Rocks or Earth, and at good distances from the Sea, where the grounds are no higher than the *Volaterran hillock*, which meeting with suitable *petrifying juices*, may either be wholly *petrified*, or where the juices are not competent, be only *metamorphos'd* in part, some of the *shelly* substance still remaining ; or not changed at all, as in the instances of *Steno*, and perhaps of Mr. *Hook*, for he tells us not where he found those *semipetrified Stones*.

116. But secondly, Suppose he found them in the highest and most In-land Counties, since he tells us not that he found them in any great plenty, we can easily also admit that some small quantities of *shells* thrown away after the Inhabitants had eaten the *fish*, may even there be filled with mud and petrifying juices, and so turned either in the whole or part into *stone*.

117. And thirdly, provided it be near a great *Town* or *City*, either now flourishing, or that did so heretofore, and hath formerly been the seat of much *action* ; it may be allowed also that some quantities of *shells* may be found, either perfectly or but imperfectly *petrified*, or that have suffer'd no change at all : which helps me to a *salvo* for my own Objection taken from the bed of true *Oyster-shells* found near *Reading*, it having been a *Town* of very great *action* during the Invasions of the *Danes*, who cutting a deep trench cross between the *Kennet* and *Thames*, and inclosing themselves as it were in an *Island*, held it against King *Ethelred*, and *Alfred* his Brother^k a considerable time ; from whence, in all probability, the *Saxons* having removed their Cattle and other provisions before the *Danes* arrival, 'tis likely that they might be supplied from their *Navy* with *Oysters*, which during the time of the aboad of the *Army* on Land, might be a very suitable employment for it : Which conjecture, if allowed, there is nothing more

ⁱ *Philosoph. Transact. Num. 76.* * *Vid. Hen. Huntingdon, lib. 5. & Asserium Menevan. de rebus gestis Alfrede.*

required to make out the possibility of the bed of *Oysters* coming thither without a *Deluge*, but that *Cats-grove* was the place appointed for the *Armies* repast.

118. Secondly, That these *formed stones* are many of them in all respects like the living *shell-fish*; thus says *Boccone*, the *Herissons Spatagi* of *stone*¹, the *Cornua Ammonis* or *Nautili lapides*^m, have the very marks, characters, eminencies, cavities, and all other parts alike, with the true living *Nautili*, and *Herissons spatagi*, and *Brissi* of *Imperato*, and *Rondelet*, which proves, says he, *the body changed to have been the very same thing, with that which is living*. But I must tell him, it do's it but very weakly, all arguments drawn a *similitudine* being the most inefficacious of all others, such rather illustrating than proving, rather perswading than compelling an *adversaries* assent: For how many hundred things are there in the *World*, that have some resemblance of one another, which no body will offer to think were ever the *same*, and particularly amongst some other *formed stones* hereafter to be mentioned. Such are the *stones Otites*, or *Auriculares*, several sorts of *Cardites*, *Lapides Mammillares*, *Hysterolithos*, &c. which though they as exactly resemble those parts of *Men* from whence they have their names, as any *Conchites* or *Echinites* do those *shell-fish*; yet no *Man* that I ever heard of, so much as dreamed that these were ever the real parts of *Men*, in process of time thus turned into *stone*. As well might we say, that our *Kettering-stone* in *Northampton-shire* here in *England*, was once nothing else but the spawn of *Lobsters*; than which, that I know of, there is nothing more like.

119. But should it be granted that these *stone Herissons spatagi* were sometime *real shell-fish*, as reasonably enough perhaps we may, they being found at *Malta*, as you come into the *Port* over-against *St. Erme*ⁿ, yet this by no means would conclude that all others of the *form* must needs be so, that are attended with much different, and indeed (in respect of having once been *shells*) inexplicable circumstances.

120. Thirdly and lastly, *That it seems quite contrary to the infinite prudence of Nature, which is observable in all its works and productions, to design every thing to a determinate end, and for the attaining that end, makes use of such ways as are (as far as the know-*

¹ *Recherches & observat. Naturelles, Lettre 26.* ^m *Libro citato, Lettre 28.* ⁿ *Libro citato, Lettre 26.*

ledge of man has yet been able to reach) altogether consonant and agreeable to mans reason, and of no way or means that doth contradict, or is contrary to human ratiocination: Whence it has been a general observation and Maxim, that Nature doth nothing in vain. It seems I say contrary to that great wisdom of Nature, that these preterly shaped bodies should have all those curious figures and contrivances (which many of them are adorned and contrived with) generated or wrought by a plastic virtue, for no higher end than only to exhibit a form^o.

121. To which I answer, that Nature herein acts neither contrary to her own prudence, human-ratiocination, or in vain, it being the wisdom and goodness of the Supreme Nature, by the School-men called *Naturans*, that governs and directs the *Natura naturata* here below, to beautifie the World with these varieties; which I take to be the end of such productions as well as of most *Flowers*, such as *Tulips*, *Anemones*, &c. of which we know as little use as of *formed Stones*. Nay, perhaps there may proportionably, number for number, be as many of *them* of *Medicinal* or other use, such as *Selenites*, *Belemnites*, *Conchites*, *Lapis Judaicus*, &c. as there are of *Plants*: So that unless we may say also (which I guess no body will) that these are produced contrary to the great wisdom of Nature, we must not of *stones*.

122. And thus I have given the grounds of my present opinion, which has not been taken up out of *humor* or *contradiction*, with intent only to affront other worthy Authors modest conjectures, but rather friendly to *excite them*, or any *others*, to endeavor collections of *shell-fish*, and parts of other *Animals*, that may answer such *formed Stones* as are here already, or may hereafter be produced: Which when ever I find done, and the *reasons* alleged *solidly* answered, I shall be ready with acknowledgment to retract my *opinion*, which I am not so in love with, but for the sake of *Truth* I can chearfully cast off without the least reluctance.

123. However, in the mean time since no doubt it will be expected, upon so deliberate rejection of *Animal molds*, that some further and more particular account should be given of the *Plastic virtue*, or whatever else it is, that effects these *shapes*: I shall briefly set down also my present thoughts concerning it, which yet I intend not *my self* (much less desire the *Reader*) to em-

brace, any further then I shall find them agreeable to future experience.

124. That *Salts* are the principal Ingredients of *stones*, I think has so sufficiently been noted already, that to endeavor any further evidence of the *thing*, would be *actum agere* in me, and loss of time to the *Reader* : And if of *stones* in general, much rather sure of *formed ones*, it being the undoubted prerogative of the *Saline Principle* to give Bodies their *figure*, as well as *solidity* and *duration* : No other principle that we yet know of naturally shooting into *figures*, each peculiar to their own kind, but *salts* ; thus *Nitre* always shoots into *Pyramids*, *salt Marine* into *Cubes*, *Alum* into *octo*, and *Sal Armoniac* into *Hexaedrums*, and other mixt *salts* into as mixt *figures*.

125. Of these spontaneous inclinations of *salts*, each peculiar to its *kind*, we have further evidence in the *Chymical Anatomy* of *Animals*, particularly in the *volatile salt* of *Harts-horn*, which in the beginning of its ascent is always seen branched in the head of the *Cucurbit* like the natural *Horn*. And we were told the last *Term* by our very Ingenious and Learned *Sidleyan Professor* * here in *Oxon*, That the *salt* of *Vipers* ascends in like manner, and shoots into *shapes* somewhat like those *Animals*, placed orderly in the *glass*. Thus in *congelations* which are all wrought by adventitious *salts*, we frequently find curious *ramifications*, as on *Glass-windows* in winter, and the figur'd flakes of *snow* ; of which Mr. *Hook*^p observed above an hundred several sorts, yet all of them branched as we paint *stars*, with six principal *Radii* of equal length, shape, and make, issuing from a *center* where they are all joined in *angles* of 60 degrees.

126. What *salt* it should be that gives this *figure*, though it be hard to determin, yet certainly it must not be a much different one from *that* which gives form to our *Astroites* and *Asteria*, whereof, though the latter have but five *points*, and therefore making *angles* where they are joyned at the *center* of 72 degrees ; yet the *Astroites* both in *mezzo Rilievo* and *Intagli*, as in *Tab. 2.* have many more. Perhaps there may be something of an *Antimonial salt* that may determin Bodies to this *starry figure*, as no question it do's in the *Regulus*, and the *Caput mortuum* of the *Cinnabar* of *Antimony*. To such a *salt* may also be referr'd our *Brontia* or *Om-*

* Dr. Tho. Millington Fellow of *All Souls Coll.* p Mr. *Hook's* Micrograph. Observ. 14. Schem. 8.

bria, and all the *Echinites*; some whereof are plainly, *all* in some measure *stellated* at the top.

127. The *Belemnites* which are all *striated* from a *center*, yet in the whole affect a *pyramidal* form; seem to have somewhat also of an *Antimonial*, but a more prevalent quantity of a *nitrous salt*.

128. The *Conchites*, *Pectinites*, and *Ostracites*, whether transversely *striated*, or from the *commiffures* to the *rim*, seem to own their origin to *urinous salts*, which shoot likewise from a *center* (as suppose from the hinges of these *stones*) but generally are most extended to one side, as may be seen in the branched figure formed on the surface of *urine* by freezing, in Mr. *Hook's Micrography*⁹; whose *striae* not obtaining much above the *quadrant* of a *circle*, whatever other difference there may be, in this respect at least is agreeable to our *stones*.

129. To which add the *Ophiomorphit's*, or *Cornua Ammonis*, most probably formed either by two *salts* shooting different ways, which by thwarting one another make a *helical* figure, just as two opposite winds or waters make a *Turbo*; or else by some simple, yet unknown *salt*, that affects such a figure: perhaps the stems and branchings bended in a most excellent and regular order, like the ribs of some of our *Ophiomorphit's*, observed by Mr. *Hook*^{*} in *Regulus Martis Stellatus*, might not a little conduce to the clearing this matter.

130. How near I am to the mark in these former Conjectures, I dare not too temerariouſly resolve: But as to the formation of the *Rhomboideal Selenites*, *Tab. 2. Fig. 1.* with a little more confidence I shall venture to pronounce it, to come from a *Tartareous salt* in the Earth; having observed in the Honorable Mr. *Boyl's* way of preparing *Tartarized Spirit of Wine*^r, that the *Calx* of *Tartar* being sated with the *phlegmatick* part of the *Spirit*, and dissolved by the heat; set to cool, sometimes shoots (I dare not say always) exactly into such *Rhomboideal* figures made up of *plates*, and the whole *Rhomboids* sometimes issuing out of one another, just as we find the *Selenites* often do.

131. More might have been added concerning some other *formed stones* hereafter to be mention'd; but I have now only time to hint my *Hypothesis*, which I suppose may be sufficiently done

⁹ *Ib. dem.* * *Micrographia observ.* 14. ^r Essay 1. of the unsuccessfulness of Experiments.

in the afore-going instances ; not intending to prosecute it further till I have had more experience, which this my present attempt serves to shew the World is yet but small. And therefore I hasten on to the residue of the *formed stones*, which according to my *method* laid down in the beginning of this *Chapter* (having done with all such as relate to the *waters*) are those that resemble any *terrestrial bodies* ; and amongst them, first of such as belong to the *vegetable Kingdom*.

132. Whereof there are some that represent whole *Plants*, and such is the *Fungites* or *Tuberoides*, found somewhere in the *Chiltern* about *Stoken-Church-hill*, and engraven *Tab. 6. Fig. 1.* of a *cinereous* colour without, but a *black Flint* within, and lively representing one of the *fungi lethales non esculenti*.

133. Others there are that resemble only the parts of *Plants*, and such is that depicted *Tab. 6. Fig. 2.* like a *Bryony-root* broken off transversly, and shewing the *fibrillæ* from the *center* to the *circumference*, with the other *striæ* descending down the *sides*, and the *annulary divisions* ; and all these in a *stone* so exactly of the colour of a *Bryony-root*, that it would be hard to distinguish it, were it not for the *weight*. This was found in the *Quarry-pits* of rubble stone near *Shot-over hill*.

134. And others there are again like the *Fruits* of *Trees*, as in *Tab. 6. Fig. 3, and 4.* which in general may be called *Lapides pyriformes*, whereof the first is a *black flint* found somewhere near *Bix brand*, above eleven inches round, and in bigness and form resembling the *Bell* or *King-pear* : The other a sort of *Pebble*, whitish without, and yellow within (as manifestly appears at the place of the *strig*) in the shape of a *Warden-pear*, found in the Parish of *Waterstock*, by the Learned and Ingenious Sir *George Croke*, somewhere near his house.

135. In the Parish of *Whitchurch* not far from *Hardwick-house*, I found a hard stone in the form of an *Apricock*, with the *Rimula* or cleft from the *pedicle* to the *apex*, just as in the true *plum*, and as depicted *Tab. 6. Fig. 5.* And in the *Quarries* of rubble stone near *Shotover-hill*, I met with a kind of *spar*, shot exactly into *protuberances* (and in the whole bulk) like a *Mulberry*, as in *Fig. 6.*

136. On the *Chiltern-hills* near to *Sherbourn*, I found a white *Flint*, with another set in it, in the form of a *Luca Olive*, as in *Fig. 7.*

Fig. 7. To which may be added, the *Lapides Judaici* of Oxfordshire, which though of a much more slender and longer figure than any sort of *Olive*, yet because in other Countries they are found in that shape, and for that very reason called sometimes *Pyrenes*, and treated on by *Authors* amongst *stones* relating to the *fruits* of *Trees*, I shall not change their place. We find them here of different sizes, from about two inches in length and an inch and half in circuit, downwards to an inch and less in length, and not much above half an inch round: Most of them have a kind of *pedicle*, from which they seem to have had their growth, and are *ridged* and *channelled* the whole length of the *stone*, the *ridges* being *purled* with small knots, set in the *Quincunx* order, as in *Tab. 6. Fig. 8.* As to their *texture*, I find it to be very curious, made up of *Lamellæ* or little thin *plates*, not unlike the *stone Selenites*; only these are *opaque*, and the whole bulk of the *stone* indeed much different. The *Plates*, as in the *Selenites*, seem to be made up of *strings*, which in most of them run *three*, but in some but *two* ways; according to the running of these *strings* the *stones* will easily cleave, but generally some one way rather than any other, which most commonly is agreeable to the *helical* running of the *ridges* of knots or furrows between them, yet all ways obliquely to the *Axis* of the *stone*, as is perfectly shewn, *Tab. 6. Fig. 9.* which represents the *stone* broken the three several ways.

137. By *Authors* they are said to be of different *Sexes*, the lesser and rounder of the *feminine*, and the greater and longer of the *masculine* gender; whereof the former is good against the *stone* in the *bladder*, and the latter against it in the *kidneys*, for which reasons they are sometimes by *Authors* called *Eurrhei*, and *Tecolithi*. The greater and longer, says *Gesner*^c are rarely found, but that must be restrained to his *own* Country; for here in *Oxfordshire*, and particularly in the Quarries of rubble stone near *Shotover-hill*, we have plenty of them.

138. There is another sort of *them* also at the same place, much more slender than the rest, plain and smooth, without either *ridges* or *channels*, mention'd by *Cæsalpinus*^u; which (and not the *Lapis Judaicus*) by *him* is said to be the true *Tecolithus* of

^c *Gesner de Figuris Lapidum, cap. 9.* ^u *Idem loco citato.* ^v *Andreas Cæsalpinus de Metallicis, lib. 2. cap. 44.*

Pliny™, that breaks and expels the *stone*; if the *Patient* do but lick it. Of colour without, it is a whitish yellow, and breaks into shining white *plates* obliquely to the *axis* of the *stone*, like the former, but whether made up of *threads* running differing ways, I could not afford to try, having but one of the kind; which was found and given me, beside several other matters of the same nature, by my very good Friend *Edward Tyson A. M.* an ingenious and industrious searcher into the works of *Nature* and *Arts*.

139. Hither also must be referr'd the fresh water *Adarce* made at the *Cascade* at *Sommerton*, which though but a meer *incrustation*, and formed not of it self, but *ad formam alterius*, viz. of the *grafs* about which it gathers, and therefore none of the *Litophyta*; yet it having some *form*, though but *accidental*, I have thought rather fit to misplace it here, than omit to shew the Reader how prettily the *grass* is sheathed with *stone*, which is accurately expressed by *Fig. 10.*

140. Thus having done with the *Lapides quercidæ*, I proceed to the *stones* resembling *Animals*, either in the whole or parts; amongst which, some there are that seem to have been *reptils* petrified, which possibly enough coming to the places where they are now found in *stone* without the difficulties of a *flood*, may be true enough too: though I know some places in other *Counties*, where there are *Cochleomorpha*'s or *snail-stones* so thick, that they seem unlikely to have ever been the *spoils* of that *Animal*. In *Oxford-shire* indeed I have met with but two, one at *Teynton*, and another in the rubble *Quarries* near *Shotover-hill*, both which being of the same *shape*, colour and bigness, are represented together under *Fig. 11.*

141. At the same rubble *Quarries* we find also the *Lapides vermiculares*, or *worm-stones* of two sorts, whereof one is of a whitish yellow colour, not hollow within, and as far as I could perceive of the same texture with the rubble *stone* it self; some of them are of the bigness of a small quill, and lie in the rock in *mezzorilievo* irregularly contorted, much after the manner of the *Vermicchiara*, or *Alcyonio Milesio* of *Ferrante Imperato**, as in *Tab. 6. Fig. 13.* whereas the other sort lies in the very body of the *stone*, of a white colour, and regularly curled up like the

™ *Nat. Hist. lib. 37. cap. 10.* * *Dell' Hist. Naturale, lib. 27. cap. 8.*



To the right Worsp^d
the virtuous & most accomplisht Gent.
S^r THOMAS CHAMBERLEYN Baron
This first Table
of FORMED STONES wth
all imaginable respect is
humbly dedicated by
R P L L D

spring of a *Watch*, as in *Fig. 12.* After those that concern *Reptils*, come we next to formed stones that resemble the parts of *four footed beasts*, whereof we meet with one sort in the Quarries at *Heddington*, set in the body of the *Stone*, the most like to the head of a Horse of any thing I can think of; having the *ears*, and *crest* of the *mane* appearing between them, the places of the *eyes* suitably prominent, and the rest of the *face* entire, only the *mouth* and *nostrils* are absent in them all, as in *Tab. 7. Fig. 1.* These are plentifully enough found, and of divers cizes, yet not mention'd that I know of by any *Author*, wherefore I have taken the boldness to fit them with a name, and in imitation of other *Authors* (in the like case) shall call them *Hippocephaloides*.

143. At *Heddington* in the same Quarry there are plenty of *Cardites*, or stones in the forms of *hearts*, but by *Authors*, because of their bigness, generally called *Bucardites*, or stones like *Bulls hearts*. These at *Heddington* are all of them of a whitish yellow colour, smooth and plain, as in *Tab. 7. Fig. 2.* but there are others found about *Brise-Norton* and *Witney*, that seem to be ribbed on each side, as in *Fig. 3.* Of these I had one sent me by my worthy Friend *Robert Perrot Esq;* from *North-Leigh*, ten inches round, and near two pounds in weight, which is the biggest of the kind that I ever yet saw, except one that I found at *Shetford*, going up a little hill east-ward of the town, about 20 pounds in weight, though broken half away, curiously reticulated with a white-spar-colour'd stone, as in *Tab. 7. Fig. 4.* which being much too heavy for my Horse-portage, was afterward upon my direction, fetch'd away by that miracle of Ingenuity *Sir Anthony Cope*, since whose decease it is come I suppose into the hands of his equally ingenious Brother *Sir John Cope*, the Heir of his Virtues as well as Estate.

144. To these add the *Orchites*, or *Lapides testiculares*, that lie at the foot of *Shotover-hill*, which though indeed they extravagantly exceed those parts as well of *beasts* as *men*, yet of the two I rather thought fit to place them here: Most of them lie in pairs coupled together, as in *Tab. 7. Fig. 6.* and are called *Diorchites*; but sometimes (as it also falls out in monstrous *Animals*) there are three of them found together, and then we call them *Triorchites*; whereof there are two or three on the foot of the same Hill of so

vast a bigness, that I guess they cannot be less than a *tun* in weight! I am sure that which lies highest on the Hill, and is here represented *Fig. 5.* is so much at the least. Of these all that Western side of the Hill seems to be composed, if one may guess by their appearance above the ground on each hand the way; but how they should come there, or with what *Animal*-mold formed (if not by some peculiar *plastic* power in the *earth*) I leave to the favorers of that opinion to find.

145. Hither also I must refer for the very same reason, a sort of stone found in the Quarries of rubble stone near *Shotover*, composed as it were of *filaments* like *hair*, which yet must not be the *Polythrux* of *Pliny*^{*} because not greenish, nor the *Bostrychites* of *Zoroastres*, or the *Corsoides* of the same *Pliny*[†], because neither gray nor long. However, let it be a *Thrichites* (though the word be differently used by *Dioscorides*[‡]) and the rather placed here, because most like the short hair of *beasts*: Of colour it is yellowish, and each hair (as they appear in the *Microscope*) seems to be *striated* and *channelled* its whole length; but to the naked eye they shew themselves only in *columns*, which at certain distances are all jointed, as in *Fig. 7.*

146. Beside the *stones* representing the parts of the *Viviparous*, I have met with one that seems to belong to the *oviparous Quadrupedes*, and that is a *Bufonites* or *Toad-stone*, which perhaps may better deserve its name, than any yet mention'd by other *Authors*. For by my *Bufonites* or *Toad-stone*, I intend not that shining polish'd *stone*, first demonstrated by the Ingenious and Learned Dr. *Merret*, in His *Majesties* presence, to be nothing else but the jaw-tooth or grinder of the *Lupus marinus*, and so confest to be by the *Gold-smiths* that sold them. But a certain reddish liver-colour'd real *stone*, indeed of the form of those of the *Shark-fish*, i. e. like the *segment* of a *sphere*, convex at the top, and concave underneath, as in *Tab. 7. Fig. 8.* but found amongst the Gravel in *Magdalen Coll. Walks*: and may be so called (as I presume the others are) from some resemblance they have to the figure of a *Toads skull*, not that there comes any such thing out of a *vexed toads* head, as is commonly and no less fabulously reported.

147. The *stones* that resemble the parts of *Men* being next to be consider'd, I shall begin with those that have relation to the

* *Nat. Hist. lib. 37. cap. 10.* † *Idem loco citato.* ‡ *Lib. 5. cap. 114.*

head, and so descend in order to the lower *parts*: According to which *method*, the first that presents it self is one of the *Brontia*, whose upper part was described before, *sect.* 33. of this *Chapter*, where I had also shewn its *basis*, but that it somewhat resembles part of the ἐγκέφαλον, or *basis* of a *Mans* brain, yet included within its *dura Meninx*, with the several *pairs* of *nerves* cut asunder as they come through it, according as the *brain* is prepared and inverted in Dr. *Willis*'s new way of dissecting it: Beside the *exit* of the *processus Mammillares*, and several *pairs* of *nerves*, it has a fair resemblance of the *Cerebellum* at *a a*, and of the *Medulla oblongata* at *b b*, as is plainly represented in *Tab.* 7. *Fig.* 9. This was found, as above-said, in the *Chiltern Country*, and much better deserves the name of *Encephaloides*, than any described by *Aldrovandus*^b, or others.

148. Add hereunto another sort of *stone*, found in the rubble Quarry near *Shotover-hill*, lively representing the *Olfactory nerves* or *par primum*, entire and whole, and not cut off. Of these there are many to be found in these *pits* of a yellowish colour, smooth without, and I think all of them (for I have broke several) hollow within, as in *Tab.* 7. *Fig.* 10.

149. I have also a *stone* (not unlike a *pebble*) found somewhere in the gravel near the *City* of *Oxford*, of an oval figure, and for the greatest part of a reddish colour; but at one end distinguish'd, first with a circle of white, within which is a *Zone* of the proper colour of the *stone*, and then a round *pupilla* of white, in the whole resembling the figure of an *Eye* obscured by a *Cataract*, as in *Tab.* 7. *Fig.* 11. This I should have taken for the *stone* called *Beli Oculus*, but that *Boetius*^c expressly makes the body of that to be of a white colour: The nearest it comes to any yet described, is the *Leucophthalmus* of *Pliny*, which he plainly says is of a reddish colour, in which yet it carryeth the form of an *Eye* both for white and black^d: And so do's ours, only it wants the black *Pupilla*, which we must suppose to be covered by a *Cataract*. However, it may pass for an *Ophthalmites*, or some sort of *Eye-stone*: whence I proceed to some others, in shape also of another of our *senses Organs*.

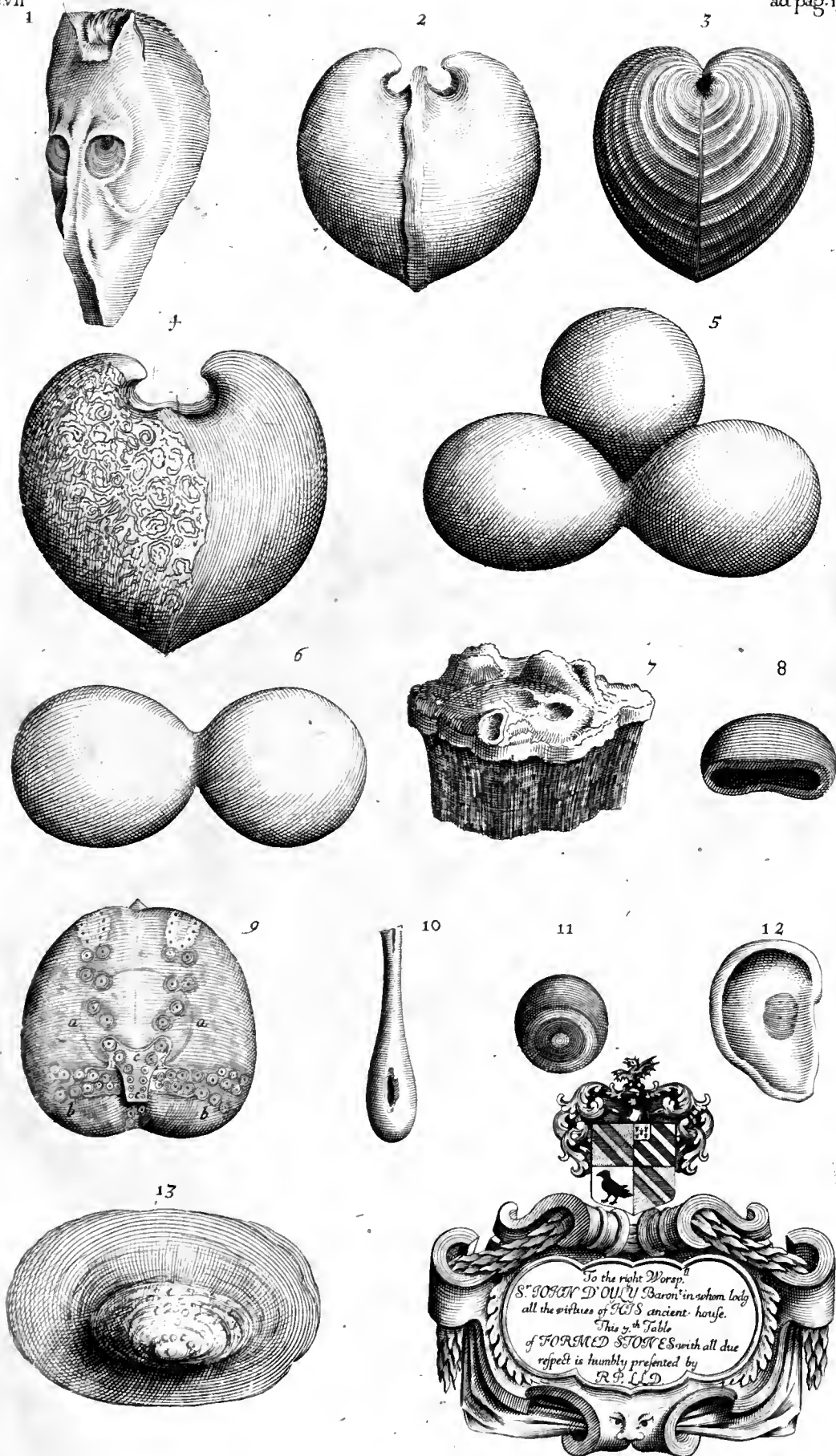
^b *Museum Metallicum*, lib. 4. c. 1. pag. 477. ^c *Boetius de Boot*, de lapid. & gem. lib. 2. c. 99. ^d *Nat. Hist.* lib. 37. cap. 10. ^e *Vid. Erasmi Colloquium cui Tit. Peregrinatio Religionis er go.*

150. Which by reason they so well resemble the *Ears* of a *Man*, though much less, as in *Tab. 7. Fig. 12.* I have made bold to call them *Otites*, or *Auriculares*: Of which we have plenty in the rubble Quarries near *Shotover*, in the banks of the High-ways North of *Fulbrook Church*; but the most I saw any where yet, are in a bank near a *spring* rising at *Sommerton Towns end*, Eastward from the *Church*, in the *Lordship* of the Worshipful *Richard Fermor Esq*; whose many ingenious Contrivances about his House, beside other assistances he readily afforded me, have eminently contributed to this *History*, as will more abundantly appear in the *Chapter of Arts*.

151. From the *Upper*, I descend next to such *formed Stones* as resemble any of the parts of the middle *Ventricle*, or *Thorax*: whereof I met with some on *Stoken-Church Hill*, of a Flinty substance, strangely like to *human Paps*, or *Duggs*; having not only the *Mamma*, but *Papilla* too, surrounded by an *Areola*, and studded with small protuberances, as in *Tab. 7, Fig. ult.* and therefore well deserving the name of *Mammillares*: than which yet I had once a much better pattern, unhappily lost in the portage, betwixt my *Chamber* and the *Gravers*.

152. And if we look further into the *inner parts*, I have a *stone* that so exquisitely represents the *Heart* of a *Man*, as in *Tab. 8. Fig. 1.* that at, and near the *basis*, there remains the trunk of the descending part of the *Vena Cava* at *a*, the ascending portion of the *Vena Cava* at *b*; and from the left *Ventricle* the trunk of the *Arteria magna*, tending upwards at *c*, and a portion of the same *Artery* tending downwards at *d*. This was also found on the Hills near *Stoken-Church*, being a whitish kind of *Flint*, and perhaps may merit the name of *Anthropocardites*. Whereunto add another found in the Gravel near *Oxford*, by my ingenious Friend *John Banister M. A.* of *Magdalen College*, which though not so exactly of the shape of a *Heart* as the former, yet because *stellated* all over from the *basis* to the *mucro*, as in *Fig. 2.* I thought its admittance would not be ungrateful to the *Reader*.

153. Other *stones* there are also in likeness of some parts of the *Abdomen* or *lowest Ventricle*; such are the *stones*, *Didymoides*, found in the Quarries of rubble stone near *Shotover-hill*, having upon it both the *rugosity*, and *suture* of the *Scrotum*, And *Phalloides*, which I met with near the *Wind-mill* at *Nettlebed*, perfectly representing.



presenting the *glans* and *præputium penis humani*; but without any *frænum* fastened to the *urethra*; Of which out of modesty I have given no *sculptures*.

154. To these add another *stone* which we may call *Lapis Nephriticus*, not from any likeness either in colour or effect to the whitish green *stone* used in distempers of the *Kidneys* (though the *signature* it carries might persuade a tryal) but from the colour and figure it has of the *Kidney* of an *Animal*, with a *trunk* of one of the *Vreters* descending from the hollow of it, as in *Tab. 8. Fig. 3.* This *stone* was lent me by the Reverend and universally Learned Dr. *Ralph Bathurst*, Vice-Chancellor of *Oxford*, and Dean of *Wells*, one of the most cordial *Encouragers* of this design; who found it hanging to an *Oyster* by that part which represents the *Ureter*, which was then so soft that he easily cut it away with his knife; but within less than an hour (like the *Gorgonia* of *Pliny**) it grew as hard as the rest of the *stone*, which I guess may be equal to that of a *Pebble*: preserving, I suppose, its native softness whilst it enjoyed the *salt steams* in the heap of *Oysters*, and not hardning till exposed to the putrefying *Air*; which evidently shews (though the opinion be exploded of *Coral*) that there are indeed some other *Sea* things, soft under water, or whilst they enjoy the steams of it, that as soon as exposed to the fresher *Air*, become presently *stones*.

155. Next the *stones* that relate to either of the three *Ventricles*, come we next to such as concern the *Artus*, or other members of the *body*: Amongst which, I have one dug out of a *Quarry* in the *Parish* of *Cornwell*, and given me by the ingenious Sir *Thomas Pennyston*, that has exactly the figure of the lowermost part of the *thigh-bone* of a *Man*, or at least of some other *Animal*, with the *capita femoris inferiora*, between which are the *anterior* (hid behind the *sculpture*) and the larger *posterior sinus*, the seat of the strong *ligament* that rises out of the *thigh*, and that gives safe passage to the *vessels* descending into the *leg*: And a little above the *sinus*, where it seems to have been broken off, shewing the *marrow* within of a shining *spar-like* substance, of its true colour and figure, in the hollow of the *bone*, as in *Tab. 8. Fig. 4.* In compass near the *capita femoris* just two foot, and at the top above the *sinus* (where the *thigh-bone* is as small as any

* *Nat. Hist. lib. 37. cap. 10.*

where) about 15 inches; in weight, though representing so short a part of the *thigh-bone*, almost 20 pounds.

156. Which are *dimensions*, and a *weight*, so much exceeding the ordinary course of *nature*, that by *Agricola*^c, *Cæsalpinus*^f, and *Kircher*^g, such *stones* have been rather thought to be formed either in hollows of Rocks casually of this *figure*, and filled with *materials* fit for *petrification*; or by some other sportive *plastic power* of the Earth, than ever to have been real *bones*, now *petrified*.

157. And that indeed there are *stones* thus naturally fashioned, must by no means be doubted, since no question the stony teeth of which there are Cart-loads to be had in a *Cave* near *Palermo*, beside others in the shape of *leg* and *thigh-bones*, and of the *Vertebræ* of the *back*, are no others than such^h. None of them, as the judicious *Charles Marquess* of *Ventimiglia* well observed, having any *signs* of *hollowness* for the place of the *marrow*, much less of the *marrow* it self.

158. Which has fully convinced me that this *stone* of ours was not so produced, it having those *signs* exquisitely expressed; but must have been a real *bone*, now *petrified*, and therefore indeed not properly belonging to this place. However, it being now a *Stone*, and not coming to my hands whilst I was treating of *petrifications*, I have rather thought fit to throw my self upon the *Readers* candour, and *mis-place* it here, as I did the *Adarce*, than altogether to omit so considerable an instance.

159. But against this opinion of its having been once a *real bone*, there lies a considerable *objection*, *viz.* that it will be hard to find an *Animal* proportionable to it, both *Horses* and *Oxen* falling much short of it. To which if it be answer'd, that it may be much increased in the *petrification*; it may again be replied, that though indeed there be an *augment* in some *petrifications*, yet that it is not so in *all*: for though in all *petrifications* there be an ingress of *steams* and *particles* that were not there before, and therefore either a cession of some other body required, or a necessary *augmentation*; yet that those *petrifying steams* are sometimes so thin and fine, that they require only the *cession* of some *Airy* or *Æthereal atoms* contained before in the porous parts of

^c De Natura Fossilium, lib. 7. ^f De Metallicis, lib. 2. cap. 48. ^g Kircheri Mundus subterraneus, lib. 8. sect. 2. cap. 4. disq. 2. ^h Idem loco citato, disq. 1.

the *body* to be changed, as indeed it appears to have been in this instance of our *petrified bone*: for with it was found a *tooth*, depicted *Fig. 5.* in its exact bigness, weighing two ounces and $\frac{1}{4}$, not at all *petrified* but perfect *bone* still, rather exceeding than any thing short of it in *proportion*; whence it must necessarily be concluded, that there could be but little if any *augmentation* at all.

160. And if it be asked how it should come to pass that the *thigh-bone* should be *petrified*, and not the *tooth*, it may be answered, and that *experimentally* too, that *teeth* admit not so easily of any change or *petrification*, because they are much more closely compacted *substances* than any other *bones*; whence 'tis, that we so often find them sound and good, when all other *bones* are consumed. Thus at *Bathendown*, or *Bannerdown* (the *Mons Badonicus* of *Nennius*) not far from *Bath* in *Somerset-shire*, there have been Cap fulls of *teeth* picked up by such as followed the Ploughⁱ, but we are told of no other *bones* found there. And we are informed by *Fazellus*, in his *History of Sicily*, that of two *Giants Skeletons*, one found by *Johannes à brachiis fortibus*, in the Field *Gibilo*, a mile South of the Town *Mazarenum*, now *Mazara*; and the other by *Paulus Leontinus*, not far from *Palermo*, that when they came to be touched, all fell into dust but the *dentes molares*, or the greater teeth called the *Grinders*^k, sufficient Arguments (I had almost said) of their unalterable state.

161. Since then it seems to be manifest, that the size of the *bone* has been scarce alter'd in its *petrification*: It remains, that it must have belong'd to some greater *Animal* than either an *Ox* or *Horse*; and if so (say almost all other *Authors* in the like case) in probability it must have been the *bone* of some *Elephant* brought hither during the Government of the *Romans* in *Britan*: But this opinion too lies under so great difficulties, that it can hardly be admitted; which are briefly these.

162. First, That we do not find that any of the *Roman Authors*, who elsewhere are large enough in describing the *Elephants* behavior in *fight*, and how terrible they were to some of the *Trans-Alpine Nations*, mention any such matter in any of their *Expeditions* into *Britan*. *Dion*^l, 'tis true, says, That *Clau-*

ⁱ *Stow's Annals*, in the Life of King *Arthur*. ^k *Tho. Fazelli de rebus Siculis Decad. prioris, lib. 1. cap. 6.*
^l *Dionis Cassii Rom. Hist. lib. 60.*

dius Cæsar, when he was called to the assistance of the *Prætor Aulus Plautius*, sore pressed by the *Britans*, then revenging the death of their slain Prince *Togodumnus*, amongst other preparations, gathered together his *Elephants*, τῶν τε ἄλλων, καὶ ἐλεφάντων περιουσίαις, are his very words. But *Suetonius* in his life, where he is very particular concerning this *Expedition* into *Britan*, mentions no such matter; nor indeed doth *Dion* say, that he brought *them* hither with *him*, only that *he* gather'd *them* together in order to it. But they both agree in this, that *he* met with such storms in his intended passage by *Sea* thither, that he was forced to put in at *Marseilles*, and march by *Land* quite through *France* to *Gessoriacum*, now supposed to be *Boulogne*, from whence 'tis true he passed over to *Britan*. But so swift was his motion in this *Expedition*, that they also both agree, that he was returned to *Rome* again within six months, a time scarce agreeable with the motion of so unwildy Creatures as *Elephants*; which in all likelihood were therefore left behind at *Marseilles*, because hindered by the weather of their *Sea* portage, and never transported into *Britan* at all. Nor find I in other *Authors*, that it was ever after attempted. One there was, 'tis true, sent hither as a present by *St. Lewis* the 9th, King of *France*, to King *Henry* the Third, Anno 1255. which, says *Matthew Paris* *, was the first seen on this side the *Alps*; and perhaps there may have been two or three brought for shew hither since: but whether it be likely any of these should be buried at *Cornwell*, let the *Reader* judge.

163. Beside, had this *thigh-bone* and *tooth*, and the several others that have been found in *England*, such as the two *teeth* taken up at *Edulfsnefs* in the County of *Essex*, in the Reign of King *Richard* the First, that might have been cut into two hundred of an ordinary cize^m; and divers other *bones* and *teeth* found at *Chartham* near *Canterbury*ⁿ, and *Farley* near *Maidstone* in *Kent*, whereof I have one now by me, dug up and given me, by the truly Noble and Ingenious *Jacob Lord Aspley*, near seven inches round, and five ounces and $\frac{1}{8}$ in weight, of which more when I come into *Kent*. Had, I say, these *bones* and *teeth* been ever the spoils of *Elephants*, we should certainly at some time or

* *Matth. Paris in Reg. Hen. 3. in Anno Dom. 1255.* ^m *Cambden in Essex.* ⁿ *Chartham news, set forth by Mr. Job Somner.*

other have met also with those greater *Tusks* with which they are armed, of which I have not heard there have been any yet found in *England*, nor any thing like them.

164. Add hereunto what prevails with me much, that since the great conflagration of *London*, Anno 1666. upon the pulling down of *St. Mary Wool-Church*, and making the site of it into a *Mercat-place*, there was found a *thigh-bone* (supposed to be of a *Woman*) now to be seen at the *Kings-head Tavern* at *Greenwich* in *Kent*, much bigger and longer than ours of *Stone* could in proportion be, had it been intire. We have also here at *Oxford**, a *thigh-bone* that came from *London*, three foot and two inches long, which I guess may be of an agreeable proportion with ours. And the same day I brought the tooth from *Cornwell*, there were two others happily procured for me by my worthy Friend *Samuel Fowler A. M.* dug up in the Parish Church of *Morton Valence*, about seven miles from *Glocester*, in the way thence to *Bristol*, in all points so exactly like the other from *Cornwell*, in ridges, cavities, &c. that had they not differ'd somewhat in colour, they could scarce have any way been distinguish'd. Now how *Elephants* should come to be buried in *Churches*, is a question not easily answered, except we will run to so groundless a shift, as to say, that possibly the *Elephants* might be there buried before *Christianity* flourish'd in *Britan*, and that these Churches were afterward casually built over them.

165. If it be urged out of *Ponticus Virunnus*, and some others, that the Emperor *Claudius* was at *Glocester*, and that he built that City after his own name, in memory of the Marriage of his fair Daughter *Gennissa*, with *Arviragus* then King of *Britan*°, where possibly he might have some of his *Elephants* with him, which might dye and be buried thereabout. It must be answered, that notwithstanding the name of *Claudii Castrum*, now *Glocester*, seems so much to favor the story in hand, that yet in all likelihood there was never any such matter: For neither *Suetonius*†, who numbers up all the Daughters that he had, and shews how given in Marriage. Nor *Dion*‡, who do's the same (who lived in his time, and had born the Office of *Consul*) remember any such Daughter, or so disposed of to *Arviragus*.

* In the Medicine School. ° *Pont. Virunnii, Hist. Britan. lib. 4.* † *Sueton. in vita Claudii.* ‡ *Dion. Cass. Rom. Hist. lib. 60.*

166. Beside, how was it possible that *Claudius*, who came hither, and was returned again to *Rome* within six months, should find so much time, as to come up so far in the Country as *Glocester*, much less to celebrate such a Marriage, and build that *City*, since the same *Dion* expressly says, that of those six months time, he was here in *Britan* but sixteen days, ἀφ' ὧν, ἐκκαίδεκα μῆνας ἐν τῇ Βρετανίᾳ ἡμετέρας ἐποίησε, are his own words^r, and those sixteen days in all probability, were spent in ordering his Army, and joyning them with the Forces of *Plautius* that lay then at the mouth of *Thames* ready to receive him, and in taking of *Camulodonum*, which the same *Author* asserts he did that Expedition, and so immediatly returned.

167. But what is *instar omnium* in this difficult point, there happily came to *Oxford* while I was writing of this, a living *Elephant* to be shewn publicly at the Act, *An.* 1676. with whose bones and *teeth* I compared ours; and found those of the *Elephant* not only of a different shape, but also incomparably bigger than *ours*, though the Beast were very young and not half grown. If then they are neither the bones of *Horses*, *Oxen*, nor *Elephants*, as I am strongly perswaded they are not, upon comparison, and from their like found in *Churches*: It remains, that (notwithstanding their extravagant magnitude) they must have been the bones of *Men* or *Women*: Nor doth any thing hinder but they may have been so, provided it be clearly made out that there have been *Men* and *Women* of proportionable stature in all *ages* of the World, down even to our own days.

P68. The Sons of *Anak*, no question, were very great men, and *Goliath* for certain was nine foot nine inches high^s. We read also of the *Sons* of the *Titans*, and of high *Giants*^t, and of *Giants* famous from the begining, that were of great stature and expert in War^u. And (to omit the Fables of the *Giants* of Mount *Erice* near *Drepanum* in *Sicily*, 200 cubits high, of *Tanger* in *Mauritania* 60 cubits^w, and of the *Giant* found standing in a Rock, cleft by an Earth-quake in the Isle of *Candy*, 46 cubits, supposed to be *Orion*, or *Otus*^x, and several others mentioned by *Pblegon*^{*}.) Amongst the *Romans*, *Theutobochus* King of the *Teutones* or *Germans*, vanquish'd by *Marius*, is reported by *Florus* to be *insigne*

^r Idem lococitato. ^s 1 Sam. c. 17. v. 4. ^t Judith 16. v. 7. ^u Baruch 3. v. 26. ^w Vid. Athan. Kircheri *Mundum subterr. lib. 8* sect. 2. cap. 4. ^x Plin. Nat. Hist. lib. 7. cap. 16. ^{*} Pblegon Trallianus de rebus mirabilibus, cap. 11, 12, 17, 18, 19.

phispectaculum, so very tall, that he was seen above all the *Trophæes*¹, which were the spoils of the *Enemies*, usually carried aloft upon the tops of spears. *Nævius Pollio*, says *Pliny*², was so great a *Giant* (having no account of his dimensions) that it was taken for a wonderful strange thing, that when a great press of people came running upon him, he had like to have been killed.

169. But to come closer to the business, and more determinate stature, the same *Pliny*³ tells of two others living in the time of *Augustus*, nick-named *Pusio* and *Secundilla*, whose bodies were preserved for a wonder in the *Salustian Gardens*, that were ten foot high : and that in his time there was one *Gabbara*, brought out of *Arabia*, in the days of Prince *Claudius* the Emperor, exactly of the height of *Goliath*, viz. nine foot nine inches high^b; which being a size very proportionable to our bone found at *Cornwell*, I am rather inclined to believe, that *Claudius* brought this *Gabbara* into *Britan* with him, who possibly might dye and lay his bones here, than that ever they belonged to any *Elephant*; except we shall rather say, that here also *Corineus*, cosin to *Brute*, might kill one of *Gogmagog*'s race, and that from him the place doth take his name, as well as the County of *Cornwall*.

170. Moreover, that there were men heretofore of such vast stature, we have the testimony of *Josephus*^c, in his *Antiquities of the Jews*, where he tells us of one *Eleazar*, a Jew born, sent amongst the Presents to *Tiberius*, when *Darius* the Son of *Artabanus* King of *Persia*, after a Peace made, went as a Hostage to *Rome*, that was full seven Cubits in height. And there is a *Skeleton*^d now to be seen in the Town-hall at *Lucern*, found under an old Oak in the County of *Willisau*, near a Village called *Reyden*, within the jurisdiction of that City, that gives further confirmation, it having all, or most of the bones wherein a Man differs from other *Animals*, and being above seventeen foot high.

171. And if we consult the latter ages of the World, we shall still find that there were always some few persons vastly exceeding the ordinary stature of Men : *Joh. Cassanio*^e, though no fa-

¹ *Flori Hist. Rom. lib. 3. cap. 3.* ² *Nat. Hist. lib. 7. cap. 16.* ³ *Idem loco citato.* ^b *Idem loco citato.* ^c *Lib. 18. cap. 6.* ^d *Kircheri Mund. subterr. lib. 8. sect. 2. cap. 4.* ^e *Io. Cassanio Monastr. de Gigantibus, cap. 6.*

vorer of the stories of Giants, yet tells us of one that lived about 150 years since at *Burdeaux* in *Aquitain*, commonly called the Giant of *Burdeaux*, whom *Francis* the first, King of *France*, passing that way, beheld with admiration, and gave especial command that he should be of his Guard : but he being a Peasant of a narrow soul, and not pleased with a Courtiers life, quitted his *Halbard*, and got away by stealth to the place whence he came : Of whom the said *Cassanio* was assured by an Honorable Person, who had seen him *Archer* of the Guard, that he was of so great a height, that a Man of an ordinary stature might go upright between his legs when he did stride. And *Thuanus*^f treating of an Invasion made by the *Tartars* upon the *Polanders*, in the Year 1575. tells us of a *Tartar* slain by one *Jacobus Niezabilovius* a *Polander*, whose fore-head was 24 inches broad, and his body of so prodigious a bulk, that as he lay dead on the ground, his carcass reached to the navel of a person standing by him.

172. *Geropius Becanus*^g, Physitian to the Lady *Mary*, sister to the Emperor *Charles* the Fifth, Queen of *Hungary* and *Regent* of the *Netherlands*, assures us, That there dwelt a person within five miles of him ten foot high, and that himself saw a Woman of the same height. The tallest that I have yet seen in our days, was also a Woman of a *Dutch* extraction, shewn publicly here at *Oxford*, seven foot and a half high, with all her Limbs proportionable : when she stretch'd forth her arm, Men of ordinary stature might walk under it ; and her hand, from the *carpus* or wrist where it is joined to the *radius* of the arm, to the end of the middle finger, was full ten inches long. A stature, 'tis true, much short of any of the afore-mentioned, and indeed I believe it will be hard to meet with their fellows in these parts of the World, where Luxury has crept in, together with Civility : Yet if we look abroad amongst the present barbarous Nations of both *Indies*, where they live still according to *Nature*, and do not debauch her with the sensual Delights of the more civilized World, we shall find (if the Relations either of *English* or *Hollanders* be of any credit) that there are now *men* and *women* adequate to them in stature ; several having been seen, especially about the Straights of *Magellan*, of ten : and one near the River of *Plate* by *Tho. Turner*, 12 foot high.

^f *Jac. Aug. Thuanus Hist. Tom. 3. lib. 61.* ^g *De Gigantomachia.*

173. Whence 'tis plain, that whether we respect the more ancient or modern Times, 'tis possible enough these bones from *Cornwell* might be the bones of a *man* or *woman*, there being no decay apparent in the constitutions of Mankind from the beginning to this day, but what is adventitious and accidental; saving in the longevity of the *antediluvian Patriarchs*.

174. Beside this *Gigantick* thigh-bone, there is another *Stone* at the foot of *Shotover-hill*, amongst the *Orchites* before-mentioned, *Seet. 144.* that also represents one of the *Artus*; viz. the Leg and Foot of a Man cut off above the *ankle*, as in *Tab. 8. Fig. 6.* which from the toe to the heel is about a yard long, and perhaps in the whole may weigh 50 or 60 pounds: But I take not this for a petrification as the former, but a stone formed in this shape purely by Nature, which may therefore be termed *Andrapodites*, as might all those of the kind mentioned by *Wormius*^h. To which also may be added the *Lapis acetabulum referens*, whereof there is plenty on the *Chiltern-hills*. And a sort of *Osteocolla* found in *Heddington* rubble Quarries, which scraped, has the smell of burnt bone, and may I suppose be the same mentioned by *Gesner*^{*}, that was sent him by *Peter Coldeberg*, Apothecary of *Antwerp*.

175. After the Stones that relate to the parts of *Animals*, come we lastly to those that resemble things of *Art*, such as that in the form of a *button-mold*, *Fig. 7.* whereof there were several found in the very same Quarry with the *thigh-bone* and *tooth*, in the Parish of *Cornwell*, and no doubt did belong to the owner of those bones: And the other in the shape of the *heel* of an *old shoe*, with the *Lifts* plainly to be distinguish'd, as in *Fig. 8.* which was found somewhere near *Oxford*, and given me by the Right Reverend and profoundly Learned, *Thomas Lord Bishop of Lincoln*, one of the first *Promoters* of this Design. But both these I take to be but *petrifications*, and therefore mis-placed here like the *Adarce* and *thigh-bone*.

176. But I have another sort of *button-stone*, sent me from *Teynton*, which I take to be a meer production of *Nature*, finely striated from the top as I have seen some *hair buttons*, as in *Fig. 9.* and may therefore be called *Porpites*: Except we should rather take it for a new sort of *Echinites*, not yet discover'd, which

^h *Musæi Wormian. cap. 13. Integrum pedem hominis in lapidem versum, spectandum habet Musæum Calceolarium, Joh. Bapt. Olivus, p. 68.* * *Gesner de Fig. Lapid. cap. 12.*

is wholly left to the Readers choice.

177. In the Quarry of rubble stone near *Shotover-hill*, I met with a *Spar-like stone*, made I suppose of the dropings of petrifying water, not unlike to the bags called *Manicæ Hippocratis*, used in *filtrations* by the *Chymists*, three one above another as they usually place them, as in *Fig. 10.* And in the very same Quarry I found a single *Trochites* of a cinereous colour, so called from its likeness to a *wheel*, having *rays* coming forth of its *center*, like the *spoaks* of a *Cart-wheel* from its *stock*, *hub*, or *nave*: These are said to have affinity with the *Lapis Judaicus* in their textureⁱ, and with the *Asteriæ* in the property of moving in *Vinegar*^k, neither of which I could well try, having but *one*, and that too set in a rubble stone of the Quarry. They are found plentifully Northward in *Holy-Island*, and in the bottom of the Chanel of the River *Tees*^l, at *Braughton* and *Stock* in *York-shire*, at *Beresford* in *Stafford-shire*^m, and are commonly there called *St. Cuthbert's Beads*, whereof I intend *Cuts*, and shall treat more at large when I come to those places.

178. At the Parish of *Heath* I met with a reddish sort of stone, in the usual form of a *Whet-stone*, as in *Tab. 8. Fig. 11.* about four inches long, very hard, and for both those reasons not fit for use: it was given me by Mr. *Evans*, Rector of the place, and said by him to be taken out of a block of stone dug in the Quarries thereabout, naturally having grown in that form. And at *Stonor* there was given me a crisp'd white stone, taken up not far thence, resembling a sort of *Sweet-meat*, not like the *Confetti de Tivoli*, but rather of *Viterbo* mentioned by *Aldrovandus*ⁿ, or a sort of *Sweet-meat* we have from *Portugal*.

179. Amongst the *stones*, like things of *Art*, I think I must also number a sort of *globular iron-colour'd balls*, taken up about *Cornwell*; whereof I have two given me by Sir *Thomas Pennyston*; the one *plain* and *smooth*, the other *granulated* on the out-side, not unlike to an *Orange*, very weighty, and made up within of a golden striated substance from the *center* to the *circumference*, shewn in the *Hemisphere* of one of them, *Fig. 12.* Of these there are some so equally round, as if done by *Art*; and so they are says *Cambden* at *Huntley Nab*^o, where under the craggy Rocks

ⁱ Boet. de Lapid. & Gem. cap. 227. ^k Geo. Agricola de Natura Fossilium, cap. 5. ^l Mr. Ray's Topograph. observat. p. 116. ^m Philosoph. Transact. Num. 100. ⁿ Musæum Metallicum, lib. 4. p. 518.
• *Cambd.* in the North-Riding of *York-shire*.

they lye scatter'd here and there of divers bignesses, so artificially by Nature shaped round in manner of a Globe, that one would take them to be great *bullets*, cast for *shot*, to be discharged out of great *Ordnance*. Such as these are also mention'd by *Job. Kentmannus*, found *inter lapides ærarios*, which if broken (says he) are like the *silver* or *cinereous Marchasite*, out of which sometimes *brass* or *silver* are smelted^p, than which ours are somewhat of a better colour, but whether possess with those or a better *metal*, I must confess I have not tryed, and therefore cannot inform the *Reader*.

180. Hither also must be referred a *round stone* before mentioned, *chap. 3 sect. 30.* containing within it a white sort of *earth*, and therefore called *Geodes*, or the *pregnant stone*; differing from the *Ætites* in this, that whereas that has within it a movable *stone*, by the *Naturalists* called *Callimus*; this contains only *earth* or *sand*, that moves not at all: The outward crust of these is sometimes only an indurated *chalk*, under which are some other folds like the coats of an *Onyon*; and when found thus, by the Inhabitants of the *Chiltern* (where they are most plentiful) they are called *chalk Eggs*. Others there are of them, whose outermost *coats* are hard black *Flints*, some very thin, and others thicker, according I suppose to the seniority of their generation: For I have some of them by me whose *coats* are not much thicker than the shell of a *Wall-nut*, others stone half way, and others so almost to the very *center*; and these *Flint coats* black without side, and gradually whiter and whiter, as they approach nearer to the whitish earth contained within: whence I am almost perswaded, that however it may be in irregular *Flints*, that in these the chalky matter does turn into *stone*, and is the chief principle of their generation.

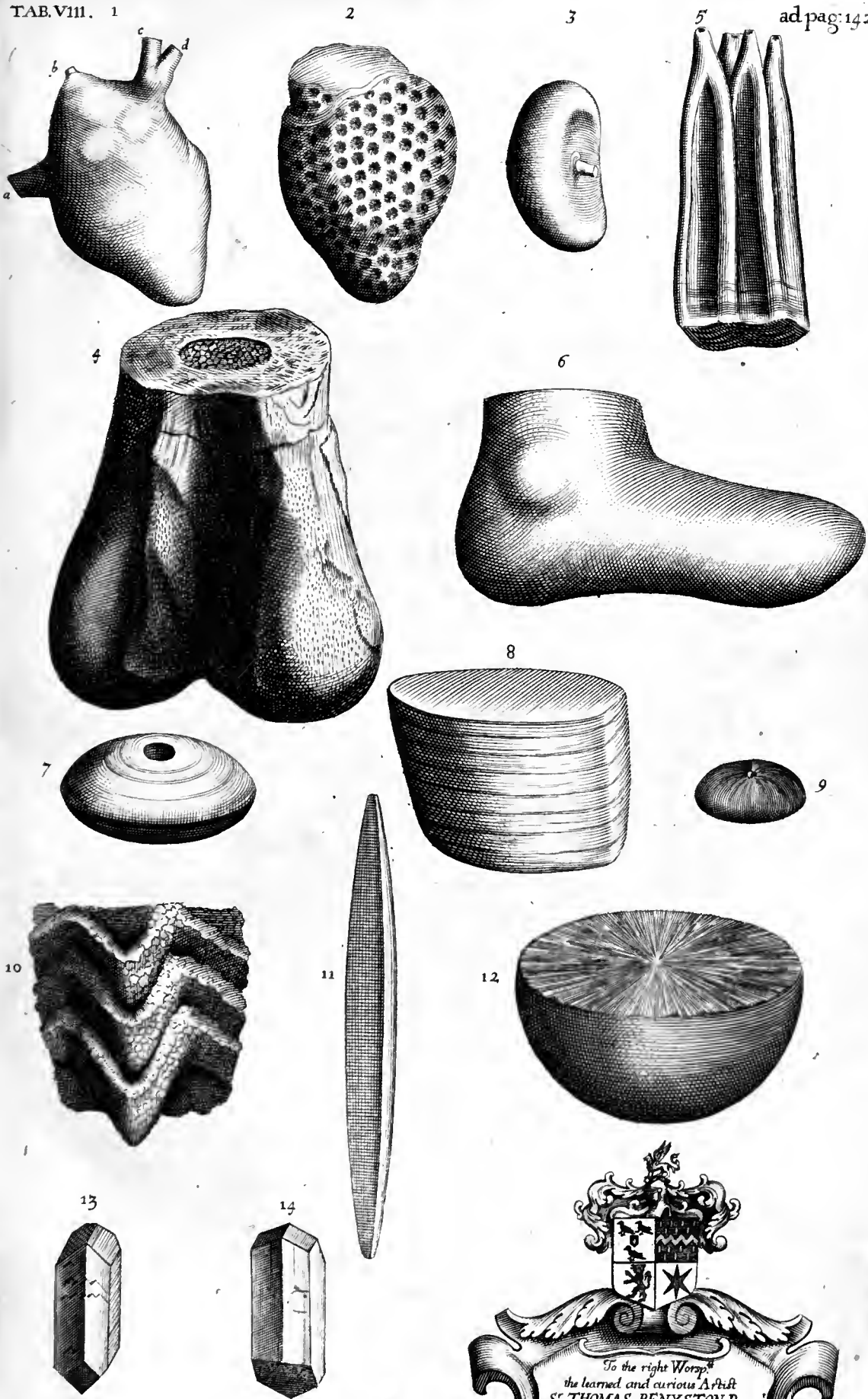
181. Upon the *Chiltern-hills*, near to *Sherbourn* and *Lewkner*, I found many of the *Flints* inclining to a *Conical Figure*. And in the gravel about *Oxford*, I have seen *fasciated Pebbles*, having as it were *Zones* or *girdles* round them, of different colours from those of the *stones*. About *Fawler* and *Stunsfield*, the *Pebbles* before mentioned, *cap. 4. sect. 18.* are most of them streaked with *iron-colour'd lines*, sometimes inclining towards one another like the ramifications of a *Dendrites*; which though not so curious as

^p *Catalog. Fossilium, Tit. 16. de Lapid. ærariis à natura effigiatis.*

the *Pietra di figure de boschi* of *Ferrante Imperato*^a, yet fit me well enough with a transition to the *Chapter of Vegetables*, which immediately follows.

182. Only I must beg leave first to advertise the *Reader*, that what I have ascribed to *Dr. Merret* concerning the *Toad-stone*, *sect.* 146. I have found since the Printing of that sheet, seemingly also given to the Learned *Sir George Ent*, by the no less Learned *Sir Thomas Brown*, in the last Edition of his *Pseudodoxia Epidemica*^r, to whether more rightly, let them contend. And that since the Printing the beginning of this *Chapter*, I received from the Right worshipful *Sir Philip Harcourt* of *Stanton Harcourt*, two kinds of *Selenites*, though of the same texture, yet much differently formed from any there mention'd; both of them being *Dodecaëdrums*, but the *Hedra* too as much different from one another, as from any of the former: The first sort of them being made up of two *Rhomboideal* sides, four oblong, and as many shorter *pentagons*; and two small *Trapeziums*, one half whereof are represented *Tab. 8. Fig. 13.* And the second, of two oblong *Hexagons*, four oblong *Trapeziums*, four oblong *parallelograms*, and two large *pentagons*, one half whereof are also represented *Fig. 14.* In both which it is to be understood, that the *Hedra* at the ends of each *stone*, are opposed by two others like them, not according to the breadth, but length of the *stone*. The two *pentagons* at the top of the *stone*, *Fig. 13.* being opposed by two others like them, behind the small *Trapezium* at the bottom of it; and the small *Trapezium* at the bottom, by another like it behind the two short *pentagons* at the top; and so the oblong *parallelograms*, and large *pentagons* at the ends of the *stone*, *Fig. 14.*

^a Dell' Hist. Naturale lib. 24. cap. 24. ^r Pseudodox. Epidem. lib. 3. cap. 13.




To the right Worsh^d
the learned and curious Artist
S^r THOMAS PENYSTON Baron
This 8th Table
of formed STONES &c whereof the 4th 5th
&c were found in his own grounds
is humbly presented by RFLD

CHAP. VI.

of Plants.

NEXT *Inanimate* things, I proceed to such as have *Life*; amongst which, first of those that hold the lowest place, that exercise the most *universal*, and therefore *inferior* Faculties, such as *Herbs*, *Shrubs*, *Trees*, all which are contained under the general name of *Plants*: But of these I intend not a compleat *Catalogue* (that being a subject of it self large enough for a *Volume*) but only a short account,

1. Of the *Indigenous Plants* of the *County*, which yet either

1. Are not described by any *Author* that we know of, or

2. Have not been noted by the ingenious Mr. *Ray*, in his excellent *Catalogue*, to be of *English* natural growth; or

3. Have indeed been noted, which yet remaining dubious, either as to the certainty of their *description*, or *specifical difference*, are cleared in this *County*.

2. Of the extraordinary *accidents* of well known *Plants*.

3. Of the *unusual Plants* now cultivated in the *Fields*, under which head somewhat of the *Husbandry* of the *Country*.

according to which *method* I shall treat of all the three forementioned *Species of Plants*; viz. *Herbs*, *Shrubs*, *Trees*, so far forth as each of them will come up to it. And first, of those stiled *herbaceous Plants*.

2. By which I understand all and only those that are made up of a *succulent* and *carnous* substance, that never in any part will become *lignous*, (or hardly any of them retain it all winter) as *Shrubs* and *Trees* do: of which those that are *indigenous*, and not described by any *Author* that we know of, are these that follow.

3. *Viola Martia hirsuta major inodora*. Which large *Violet* from a fibrous root sendeth forth many leaves, each upon his own foot-stalk, neither creeping as the common *March*, nor branched as the common *Dog-violet*; its leaves and stalks are all *hairy* especially on the back-side; they are also broader, larger, and more *pointed* than the ordinary *March Violets*, which occasioned (as some think) the ingenious Dr. Merret to note it by the name of *Viola Trachelii folio*^s, but that certainly must be some different kind, the leaves of ours being all *invecked*, as in Tab. 9. Fig. 1. whereas the *Trachelia* are all *indented*: Amongst the leaves grow large *flowers*, upon foot-stalks (as other *Violets*) of a pale blue colour, with white *lines* or *rays* issuing from the middle of them, but wholly without *scent*. They flower in *March* and *April*, and are commonly but abusively sold to the *shops* amongst other *Violets*, they not being so good for any of those uses the *Apothecaries* put them to, as other *Violets* are. They grow plentifully in *Magdalen College Cops*, on *Shotover hill*, *Stew-wood*, and many other *places*.

4. *Viola palustris rotundifolia*. From the root of this Plant, which is *white*, and at equal distances *knotted* (whence only it sends forth its *fibers* not downward, but *horizontally*) arise 3 or 4 (sometimes more) feeble small *stalks*, each bearing at its top only a round leaf, as in Tab. 9. Fig. 2. Among which, about *April* come up the *stalks* of the *flowers*, slender, like those of the *leaves*; the whole *Plant* being weak, and beholding to the neighboring *ones* for its support. The *flowers* are all small and blue, which being past, a long *Prismatical seed-vessel* succeeds, opening its self when ripe into three parts, and shewing a rank of brown *seeds*, appended to each angle by white *Nerves*: This is easily distinguish'd from all other *Violets* by its native *place*, wherein it is supposed they will not grow; and by the smallness of its *flowers*, which are considerably *less* than any of the rest; whereunto add the remarkable *roundness* of its leaves, which are so far from drawing to *points*, that the longest way of them is from side to side. *Clusius* indeed seems to describe a Plant like this, by the name of *Viola Alpina altera*^t, but makes its flower as much *greater*, as ours is *less* than the common *one*; adding beside, that it flowers about the latter end of *June*, a month be-

^t Pinax rer. Nat. Britan. p. 125. ^s Car. Clusii Plant. Hist. cap. 13.

fore which time the Seed of *ours* is ripe ; which are differences so irreconcilable, that we cannot but pronounce *ours* as distinct from *his*, as from any other *Violets* before described by *Authors*, whereof we have consulted *most*, if not *all* the best. It grows sparingly in the Boggs about *Stow-wood*, and on the Banks of *Cherwell* between *Oxford* and *Water-eaton* ; but most plentifully at *Ghilswell* in *Berkshire*, amongst the moistest Boggs.

5. *Juncellus omnium minimus capitulis Equiseti*. This least *club-rush* from small hairy roots, riseth no bigger than *horse-hair*, and not above three inches high, bearing at the top a little *club*, as in the other *club-rushes*, but proportionably lesser, as in Tab. 9. Fig. 3. where also it may be observed, that the *rush* rises *singly* from the root, and not *branched*, like the *Fluitans* mentioned by Mr. Ray ^u, who had he seen this, would certainly have owned different *species*'s of *club-rushes*, which he seems so much to doubt. It grows in *Binsley-Common*, in the moist ditches next the River *Isis*.

6. *Geranium columbinum maximum foliis dissectis*. Or the great jagged *Doves-foot Cranes-bill*, differs from the jagged *ones* of other *writers*, in that it is jagged at the first coming up, whereas all others are whole then ; its leaves are also standing on *long* foot-stalks, and much greater than those of any other *Doves-feet* ; from the middle of which there rise up *great jointed* stalks, near the bigness of a *mans* finger, branched, and almost standing upright a *yard* in height : At the *joynts*, which are largely knotted, are also large jagged leaves, which at the top grow very thick, amongst which stand the flowers upon short foot-stalks, as in Tab. 9. Fig. 4. of a bright and red colour, whereas the others are of a bluish purple ; the *seeds* being like those of other *Doves-feet*. This grows in hedges about *Marston*, and on that part of *Borley-Causey* next *Oxford*, in great plenty.

7. *Pentaphyllum reptans alatum foliis profundius serratis*. This creeping *Plant* in all respects grows like the common *Cinque-foil*, but that at the bottom some leaves are found round and undivided like *Alchimilla*, and others dividing themselves into *five*, are jagged but half way : As it increases in growth, the number of leaves oftentimes decrease, bearing four, three, two, and at the top, one ; all which, have two little leaves or ears at the bottom

^u In Catalog. Plantar. Angl.

of the foot-stalk, like *Tormentill*: The flowers are of the bigness and colour of common *Cinque-foil*, but generally made up of four leaves, as in *Tab. 9. Fig. 5.* and but very rarely to be found with five. It grows in the edges of the *Corn-fields* between *Hockley* and the Woods under *Shotover-hill*.

8. *Orobanche Verbasculi odore*. The root of this Plant is skaly and obtuse, to which are appended a bundle of complicated Fibers, like those of *Nidus avis*, whence it riseth up with a soft round very brittle stalk, seldom eight inches high, set with thin, small, short skaly leaves like skins, growing close to it: At, or very near the top of which stalk, grow sometimes eight or ten small flowers, altogether different from those of the common *Orobanche*, each consisting of four pretty large leaves, within which are contained as many lesser, as in *Tab. 9. Fig. 6.* About the seed vessel (which is round at the bottom, with a narrow neck, and a hole at the top somewhat resembling a child's sucking-bottle, as in *Fig. 6. a*) stand small chives with purplish tops, as in *Fig. 6. b.* The whole herb, flowers, stalks and leaves, are at the first flowering, of a whitish yellow, or straw colour, and being broken or bruised, smell like the root of a *Primrose*. It grows at the bottoms of Trees in the woods near *Stoken-Church*, and we find it mention'd in some MS. notes of the famous Mr. *Goodyer*.

9. *Saxifraga Anglica annua Alsine folio*. This small annual *Saxifrage* from a small fibrous root, spreadeth its trailing jointed stalks about an inch or two from it, at each joint come forth small narrow leaves as in the other *Chickweed-break stone*, and from the upper joynts toward the end of the stalks, come small herbaceous flowers made up of four leaves, which prove the case for the small included seed vessel; as in *Tab. 9. Fig. 7.* This Plant differs from the common one, which is of a light fresh green, perennial, and sometimes roots again at its joynts; in that its stalks and leaves are of a brownish green colour, the Plant annual and never reptant: it grows plentifully in the walks of *Ba-liol College* gardens, and on the fallow Fields about *Heddington* and *Cowley*, and many other places.

10. To which perhaps I might add two different *Lychnis*'s from the *sylvestris flore albo Gerardi*, observed this Year by Mr. *Richard Stapley*; one whereof bears a white flower somewhat less than the common, yet at the center having another little flowery circle,



circle, in the middle of which appear several fine *stamina*, with yellow longish *apices*, whereas the reclining *stamina* of the common *Campion* have no *apices* at all; the other also bears a white flower without that *flowery circle*, but has *stamina* crowned with roundish purple *apices*, with the dust whereof the flower it self is commonly *soiled*. But in the first of these the *seed vessel* not appearing at all, and in the second withering away with the flower; We are not so bold as to make them distinct *species*'s, not knowing as yet whence they should be propagated. These were found near *Holy-Well* in the Suburbs of *Oxford*, and grow also in the Corn-fields about *New-parks*, and as we suppose in most parts of *England*. *Sed de hoc quære*.

11. Beside these, there is also another, of which *Authors* write so obscurely, that we cannot positively say whether described or no: However, we have ventured to call it *Artiplex vulgaris sinuata spicata*, it not being like the *Pes anserinus alter sive ramosior* of *John Baubin*, mentioned by Mr. Ray^w, in that it bears its seeds in *buttons* close to the stalks, like the *Fragifera*. This grows equally common on *Dung-hills* with the *sinuata major*, amongst which we suppose it has hitherto lay hid.

12. As for the *Plants* described by other *Authors*, but not noted by Mr. Ray to be of *English* growth, we find only these in the County of *Oxford*. 1. *Clematis Daphnoides sive pervinca major*, in the High-ways between *Woolvercot* and *Tarnton*, and in several *hedges* thereabout. 2. *Lagopus major vulgaris Parkinsoni*, in *Stow-wood* plentifully, and several other places. 3. *Oenanthe aquatica minor* Park. sive *juncus odoratus Cordi*, in the ditches about *Medley* and *Binsey-Common*, and almost every where about *Oxford*.

13. Whereunto add some others indeed noted by Mr. Ray, but left in doubt whether described, or different from one another. Such are the *Helleborine flore albo*, mentioned in his *Appendix*^x to grow in the woods near *Stoken-Church*, not far from the road leading from *London* to *Oxford*, which because he had not seen either flowering, or green, modestly refused to determine whether described or no: But we having had time and curiosity of viewing it often in flower, find it to be the *Helleborine flore albo* of *Gerard* and *Tabernæmontanus*: *Epipactis angustifolia* of *Besser*,

^w In *Catalog. Plant. Angl.* ^x In *Appendice* p. 339. y *Jac. Theod. Tabernæmont. Part. 2. p. 400.*

in his *Hortus Eystettenfis*²: *Alisma quorundam Cordi*^a, and *Alisma Cymbaleanthemon Thalii*^b. Which *Authors*, and others, we have diligently searched, and by comparing them together, find the *Plant* to agree with each *Figure*, as well as they could do one with another, had they (as indeed they commonly are) been Printed from one Plate.

14. The *Plants* which he doubts whether *specifically distinct*, yet found so in *Oxford-shire*, are also *Helleborine's*; the one his *Helleborine flore atro-rubente*, and the other *Helleborine latifolia montana*^c, both plentifully growing on *Stoken-Church* hills: Whereof the *former* has small *narrow* leaves, somewhat like the *Palustris*, and growing *thicker* on the stalk; whereas those of the *latter* are *broad* and much thinner, the *one* also flowering a full *month* after the *other*, which we take to be distinguishing *Characters* enough, though not so signally differing in the flowers as Mr. Ray owns his to do; our *latifolia montana* coming nearer to that of *Gerard*, then of *him* or *Dodonæus*, having purple flowers, but as deep or deeper than those of the *Helleborine flore atro rubente*.

15. Of *Accidents* that are incident to *herbaceous Plants*, beside what I have seen amongst *forreigners* in *Gardens*, I have met also with some amongst the *natives* of *Oxford-shire*; which I guess may happen to *them* (as likewise to all *others*) most times through *excess*, or *defect* in their *nourishment*. Thus have I seen the *stalks* of *Dyers-weed* and *Succory*, from a round near the *root*, spread themselves upward into a *broad flat* stalk, as if there were several of them *fasciated* together, occasioned I suppose by reason of the ascent of *to much* nourishment for one stalk, and yet not enough for two. The *fasciation* (if I may be allowed to coyn such a word) being as it were an attempt for *two* stalks, which upon the ascent of sufficient *sap*, is sometimes accomplish'd, the flat stalk then dividing into *two*, as I observed it this Summer in a *Draba lutea siliquis strictissimis*, and several other *Plants* in the *Gardens*.

16. Which *accident* of *Plants* the *German Virtuosi* think only to happen after hard and late *Winters*^d, by reason whereof indeed the *sap* being restrained somewhat longer than ordinary, up-

² *Horti Eystett. Plant. Vernal. Ord. 9. fol. 5.* ^a *Valer. Cordi Hist. de Plant. lib. 2. cap. 107.* ^b *Ioh. Thalii, Hircynia Saxono-Thuringica, p. 13.* ^c *In Catalog. Plant. Angl.* ^d *Miscellan. curiosa Med. Phys. Acad. Nat. Curiosorum, An. 1. observ. 102.*

on sudden thaws, may probably be sent up more *forcibly* and *together*, and so produce these *fasciated* stalks; whereas the *natural* and *graduated* ascent would have produced them but single. Yet experience has taught us this present year 1676. that such productions must by no means be thus restrained; the *Winter* preceding, in *Anno* 1675. being one of the mildest ever known in *England*, and yet *fasciated Plants* as frequent as ever.

17. Beside *those*, we have observed some *others* here curiously striped; some of them *yellow*, as *Dens Leonis*, *Caryophyllata*, *Urtica urens*, &c. others *white*, as *Papaver spumeum*, *Plantago quinque nervia*, *Cruciata*, *Calamintha aquatica*, &c. Others again differing from the rest of their kind, not in *leaves*, but colour of their *flowers*; such are *Lamium rubrum*, *Lysimachia filiquosa magno flore*, *Trachelium minus*, *Gentianella fugax minor*, *Anagallis terrestris*, & *aquatica* *sive* *Becabunga*, *cum multis aliis*, all with *white* flowers; and *Hyacinths*, we have sometimes found with *red*, and *white* flowers: All which, I guess *accidentally* accrew to these *Plants* (their *species's* having flowers of different colours) through *defect*, or some *interception* of their nourishment, which occasion *diseases*, and such *discolorations* both in their leaves and flowers.

18. That this is true of all *striped Plants*, is manifest, in that such *discolorations* may be procured by *artificial* subtraction of the nourishment, *viz.* by applying *Lime*, or other hot dry matter to their *roots*; which drying up, or otherwise rendring the *nourishment* unfit, will thus make the *Plants* *striped*; as our very Learned *Botanic Professor*, Dr. *Morison*, informs us he observed it in *Dulcamara* creeping through *Lime* and other rubbish of Buildings, at the *Duke of Orleans* his House at *Blois*, whence not only *ours*, but most other *Gardens* of *Europe* have since been supplied with the *white striped Dulcamara*.

19. Moreover, that such *stripings* are nothing but *disease*, appears plainly in that most, if not all *striped Plants*, are somewhat *deformed* and *imperfect* in their leaves; and though *striped* very lively in the beginning of the *Spring*, will many of them recover in some measure, at least before *Autumn*, and some of them have their leaves at length as *green*, as the rest of the healthy *Plants* of their *kind*: Which I take to be manifest arguments of their *sickness*, and such *stripings* to be only *discolorations*, and no ornaments of perfection, though ornaments of our *Gardens*.

20. To which if it be objected that 'tis otherwise in the *Flowers* of all the *Plants* above-mentioned, which though of different *colours* from the rest of their *species*, continue so still from year to year, not altering in the *Autumn* from what they were in *Spring*: It must be answer'd, that notwithstanding what is urged be true, yet such constancy will not warrant them of a different *species*, since no *seed* they produce will bring more of their *kind*, but only such whose *flowers* will be of the ordinary *colour*; which is so great an imperfection, that we cannot but suspect these also to be *diseased*, and to have their variations only from thence.

21. Though it must be confest, that it's worthy notice too, that many of these *Plants* seem as strong, and flourish as well as any *others*, and produce perhaps their *Seed* as perfect as *any*: Why then they should be numbred amongst diseased *plants*, any more than a *red hair'd* man should be accounted so in *England*, or a *black hair'd* one in *Denmark* (where I am informed there are so few, that they commonly paint *Judas* with *black hair* as we do with *red*) is a difficulty, I guess, not easily avoided; especially since the difference of *colours* in *flowers* may be occasioned by the different textures of the stalks of some certain *plants*, as it is in the hair and feathers of *Animals*, also of different *colours* from the rest of their *species*, as shall be fully made out in the following *Chapter*. It may therefore perhaps be more safely concluded, that the different *colorations* at least of some of these *flowers*, may indeed be *accidents*, but no *accidents* of disease or imperfection.

22. Which is all I have met with concerning wild *berbaceous Plants*, and the *accidents* attending *them* remarkable in this *County*, in the relation whereof I have been all along so careful of not imposing on the *World*, that I have mention'd nothing, except in the *Philosophical* part, wherein I have not consulted, and had the approbation of some of the most knowing in the *Faculty*, such as the Reverend *William Brown* B. D. and Fellow of *Magdalen College Oxon*, *Edward Tyson* M. A. *John Banister* M. A. *Richard Stapley* B. A. and *Mr. Jacob Bobart junior*, all eminent *Botanists*.

23. Of *unusual Plants* now cultivated in the *Fields*, to pass by the ordinary red and white *Lammas Wheats*, black and white *Ryes*,
the

the common *Barley*, *Peas*, *Beans*, and *Oats*, there are several worthy notice now sown in this *County*, that have been scarce ever heard of, much less used in some *others*: Where by the way let it be noted, that the word [*unusual*] is not so much to be applied to *this*, as other *Counties*, and that in these matters of *Husbandry*, I rather write for the information of *Strangers*, than the *inhabitants* of *Oxford-shire*, as I must hereafter in other *Counties* for the information of *this*: There being many things in each *County* thought common there and unworthy notice, that perhaps in some *others* will appear so strange, that they will scarcely be believed. And such are

24. *Triticum spicâ muticâ rubrum, caule item rubro*; red stalkt wheat (mistaken by many for red *Lammas*) so commonly called from the redness of its *straw*, especially near the *joints* when the *Corn* begins to turn; which redness yet will vanish for the most part away, when it is full ripe. This *Corn*, as I was inform'd, was first propagated from some few *ears* of it pickt out of many *Acres*, by one *Pepart* near *Dunstable*, about fifty years ago, which sowed by it self till it amounted to a quantity, and then proving *Mercatable*, is now become one of the commonest *grains* of this *County*, especially about *Oxford*; which yet because not known in many other *places*, I thought fit at least to mention it, and the rather because of its seldom or never *smutting*, a convenience that pleases the *Baker* and *Husbandman* both; and yet it seems 'tis not now sown about *Thame* and *Watlington* so much as formerly, because it brings not so certain, nor so good a burthen as

25. *Triticum spicâ muticâ albicante, granis rufescentibus*, white eared red wheat, white *Corn*, or mixt *Lammas*, which latter name I take to be as agreeable as any, because of its participating both of the white and red *Lammas*, having a white *ear* and red *grain*; whereas the white *Lammas* has both *ears* and *grain* white, and the red *Lammas* both red: Nor has this, as I was told, been long in *Oxford-shire*, it being first advanced like the former from some few *ears*, and at last being found to yield considerably better than most other wheat, viz. sometimes *twenty for one*, it is now become the most eligible *Corn*, all along the *Vale* under the *Chiltern Hills*, and in far better esteem than the red stalk'd wheat, or,

26. *Triticum spicâ aristatâ glumis hirsutis*, the long *Cone* Wheat, which yet is the best of any, to be sown in *rank clay* Land, its *stalks* being reedy and not subject to lodging; and by *hedges* sides, because the Birds cannot eat it; for which reason also it must be good in *Inclosures*, besides its being the least subject of any *Corn* yet known, to the inconveniency of *Mildews*: This *sort* also yields extreamly well, but its *Flower* being coarse and not pleasing the *Bakers*, it is seldom sown but under the mentioned circumstances, except somtimes mixt amongst the other *wheats*.

27. *Triticum multiplex, sive spicâ multiplici*, double ear'd wheat, so named for that it has divers *small ears* issuing out of the sides of the *greater*, and is sown about *Bissiter* and *Weston on the Green*, but it not proving agreeable to the *soils* thereabout, nor advantageous to the *Husbandman*, it is almost quite disused, though I hear it succeeds better about *Fritwell* and *Souldern*. They sow also a Wheat about *Weston on the Green*, which from the hanging of its *ear* they call *Pendule* wheat, but suspecting that it differs in nothing from *Cone*, it being *aristis munitum*, and *glumis hirsutis*, I forbear as yet to pronounce it any *other*, though I am told that the *Pendule* has a redder and more slender, and *Cone* a whiter and fuller *ear*; and that *Cone* endures longer, and *Pendule* but a very short time here, it yielding for the first year somtimes *twenty for one*, and within two years after dwindling away, so as not to be worth sowing; which time expiring, they supply themselves again out of *Berks-shire*, at *Abington Mercat*, whereof more (if I find it to be a different *kind*) when I come into that *County*.

28. All which, 'tis true, in *Oxford-shire* are so commonly sown, that they cannot indeed in this respect be stiled *unusual*: but because scarce ever heard of in the *South-east* parts of *England*, I thought it convenient at least to hint *them*. And so likewise our

29. *Hordeum distichum præcox*, or rathe ripe *Barly*, deservedly so called from its early ripening, it having been somtimes sown and returned to the *Barn* again in two *months* time, and often in nine or ten *weeks*. This *Barly*, 'tis true, is no native of *Oxford-shire*, only much sown here, it being all had either immediatly or mediately from *Patney* in *Wiltshire*, whence by some 'tis also called *Patney Barley*: Where the soil (as I am told) is of so peculiar

culiar a quality, that what-ever other *Barly* is sown there, it is turned forthwith into this we call *rathe-ripe* ; a feat, which they say, no other *Land* will perform. But we are told by Dr. *Childrey*^e, that in the western parts of *Cornwall*, they sow a sort of *Barly* near the Sea-side, which they carry to *Mill* in eight or nine *weeks* time after they have sowed it. However, what we have here comes all from *Patney*, but is not so agreeable to our *Oxford-shire* soil immediatly from thence, as when it has been sown elsewhere twice or thrice ; after which, it endures not above three or four *years*, but degenerates again into common *Barly*. Its *conveniency* notwithstanding is very *considerable* in wet and backward *Springs*, and moist *Autumns*, when many other *Countrys* lose their *seasons*, and some of the more *Northern ones* perhaps their *crop*, the common *Barly* there never coming to be *ripe*, whereas this may be sown at the latter end of *May*, and will come to be ripe in the worst of *Summers*. This I heard of first at *Gaunt-house*, (the Paternal Estate of the *Right Reverend Father in God*, John Lord Bishop of Oxon, one of the *Noblest Encouragers* of this *Design*) but met with it after all over the *County*, it being generally approved of by all sorts of *Husbandmen*. And this is the only *Barly* sown in this *County* unknown in some others.

30. But of *Peas* there are many *sorts* little thought of *Southward*, that possibly were they known, might prove as agreeable to the *soils* there, as here, and as advantagious to the *Husbandman*. Such are the *Peas* called *Henly-gray*, and another sort called *Red-shanks*, for fresh *new broken* Land ; the *Vale-gray* for *strong* ; and *Hampshire-Kids* for *new chalkt* Land ; the small *Rathe-ripes*, for *poor* and *gravelly* ; and the *Cotswold* Pea for *sour ground*. And of *Vetches* ; in deep clay Lands they sow the *Gore* and *pebble-Vetch* ; in cold moist grounds the *rathe-ripe Vetch* ; and *Dill* or *Lentills*, in poor *stone-brass* land, which are a good *podware* for *cattle*, and sown in many parts of the *County*.

31. As for *Beans* and *Oats*, they sow only the common that are every where else ; but for *Grasses*, the usual name for any *Herbage* sown for *Cattle*, especially if *perennial* (to pass by the *trifolium purpureum majus sive sativum*, *Clover-grass* ; and *Onobrychis spicata flore purpureo, semine echinato*, commonly called *Saint-foin*,

* *Brisannia Baconica* in *Cornwall*.

or *Everlasting-grass*; but according to Dr. Morison, the true *Lucern*, now every where known, and therefore nothing concerning the qualities and advantages of it.) They have lately sown *Ray-grass*, or the *Gramen Loliaceum*, by which they improve any cold, sour, clay-weeping ground, for which it is best, but good also for dryer up-land grounds, especially light stony, or sandy Land, which is unfit for *Sainſt-foin*.

32. It was first sown (as I was told) in the *Chiltern* parts of *Oxford-shire*, and since brought nearer *Oxford* by one Mr *Eustace*, an ingenious Husband-man of *Islip*, who though at first laugh'd at, has been since followed even by those very persons that scorn'd his *Experiment*, it having precedence of all other grasses, in that it takes almost in all sorts of poor Land, endures the drought of Summer best, and in the Spring is the earliest grass of any, and cannot at that time be over-stock'd; its being kept down making it sweeter, and better beloved by Cattle than any other grass: Nay, sometimes they have been known to leave Meddow hay to feed on this: but of all other Cattle it is best for Horses, it being hard Hay; and for Sheep, if unsound, it having been known by experience to have work'd good cures on them, and in other respects the best Winter grass that grows.

33. As to the manure of it, some sow but two bushels on the Statute Acre, but 'tis best to sow three, mixt with the *trifolium agrarium Dodonæi*, called *Melilot-trefoil*, and sometimes *Non-such*, because of it self it is but a thin spiry grass, and will not be of any bulk the first year, unless thickned by the *Trefoil*, which failing by degrees, the *Ray* or *bennet-grass* (so some also call it) thickens upon it, and lasts for ever. Of *Ray-grass* and *Trefoil* thus mix'd together, one at *Islip* but lately had so advantageous a crop, that from four Statute Acres, worth not above forty shillings per annum; beside the keeping six or eight cattle till holy Thursday, and the feeding all the Winter following, had twenty Quarters of Seed worth twenty pounds, and fourteen loads of fodder, enough to winter five or six cattle.

34. The *fœnum Burgundiacum cœruleum L'Obelii*, or *Medica legitima Clusii & Dodonæi*, commonly called *Lucern*, but by the Learned Dr. Morison said to be the true *Sainſt-foin*, is also sown here, and found to agree well enough with a rich moist ground, but better by much in a warm and dry soil. This stands recommended for

for an excellent *fodder* both by Men and Beasts, especially *Horses*, which are purged, and made fat with it in the *Spring* time in 8 or 10 days. But no more of this, or any other *grasses*, they having all (but *Ray-grass*) been already described.

35. But beside *Grasses*, there have some other *Plants* been cultivated here of no mean use, such as *Cnicus*, *sive Carthamus sativus*, manured *bastard Saffron*, sometimes called *Saffore*, for dying of *scarlets*; and therefore by some called also the *scarlet Flower*, whereof there was once a considerable quantity sown at *North-Aston* by Colonel *Vernon*, the Seeds being planted in rows about a foot distant, for the more convenient hewing and keeping it clean from *weeds*: In these rows it rises with a strong round stalk three or four foot high, branching *it self* to the top, where it bears a great open skaly head, out of which it thrusts forth many gold yellow threds of a most *orient* and shining colour, which they gather every day as fast as they ripen, and dry them well; which done, it is fit for sale, and dying of *scarlet*.

36. And about *Hampton* and *Clanfield*, they make some profit of sowing *Carum sive Careum*, or the *Carui* of the *shops*, commonly called *Caruwaies*, which they sow in *March* or *April*, as they do *Parsly*; the first year (it seems) it bears no Seed, but the next it seeds and shatters, and so will hold six or seven years without new sowing, or any other care or trouble, beside keeping it from *weeds*: the encouragement they have to sow it, is the value put on it; one pound of this being esteemed by the *Grocers*, worth almost two of that which they have from *London*.

37. And this is all I have met with concerning *cultivated plants* worthy taking notice of in this County, but that like the wild *Indigenous ones*, these have sometimes accidents that attend them too: for such, and no other, were the *two ears* of *Wheat* branched from one stalk, and *six ears* of *barley* from another, found at *Fulbrook* near *Burford*, and given me by Mr. *Jourden*, since deceased. Nor have I more to add concerning them, but that I find few that I have mentioned to be noted by Mr. *Ray*.

38. Next *Herbaceous plants*, I proceed to the *Shrubs*, amongst which I met with but little extraordinary, only the *Haw-thorn* at *Bampton*, in the *bowling-green hedge*, bearing *white berries* or *haws*, which indeed I take to be a great *curiosity*: for though in *Flowers*

and Animals, *white* be esteemed by some a *penurious* colour, and a certain indication of a scarcity of *nourishment*: Whence 'tis, says my Lord *Verulam*^f, that blue *Violets* and other *Flowers*, if they be starved, turn *pale* and *white*; *Birds* and *Horses* by age turn *white*; and the hoary hairs of *men* come by the same reason. And though among *Fruits* the *white* for the most part argues but a mean *concoction*, they being generally of a *flashy over-watery* taste, as *Pear-plums*, the *white-harvest plum*, *white Bulleis*, &c^g. and divers sorts of *pears* and *apples* of that colour. Yet in *Berries* the case seems to be quite different, as we see in *Goosberries*, *Grapes*, *Straw-berries*, *Rasps*, whereof the *white* are by much the more delicate, and have the better *flavor*; which if true, in the whole *species* of *berry-bearing* Plants (as in probability it may) we have reason to conclude that the *berries* of this *Thorn* are not accidentally *white*, through *defect* or *disease* as in some other Plants, but that they are an argument of its perfection, and that the *Thorn* it self is of a quite different *species* from all known before, and may justly challenge the name of *Oxyacanthus baccis albis*. These *Berries* 'tis true, I saw not my self, not being there in time of year for them, but being certified of the truth of it by the common voice of the *Parish*, and particularly by the *Worshipful Thomas Hoard* Esq; who first told me of it, and the *Reverend Mr. Philips* Arch-Deacon of *Salop*, and one of the three *Vicars* there; (men of great ingenuity and undoubted veracity) I had no reason to question the certainty of the thing.

39. And hither I think may be referred the *Glastenbury Thorn*, in the Park and Gardens of the Right Honorable the Lord *Norreys*, that constantly buds, and sometimes blossoms at or near *Christmas*: Whether this be a Plant originally of *Oxford-shire*, or brought hither from beyond Seas, or a graft of the old stock of *Glastonbury*, is not easie to determin. But thus much may be said in behalf of *Oxford-shire*, that there is one of them here so old, that it is now dying, and that if ever it were transplanted hither, it is far beyond the memory of *men*.

40. As for the excellent and peculiar quality that it hath, some take it as a miraculous remembrance of the Birth of *CHRIST*, first planted by *Joseph* of *Arimathea*; Others only esteem it as an earlier sort of *Thorn* peculiar to *England*: And others again are of

^f Nat. Hist. Cens. i. Num. 93. ^g Here except the *Pardegwin* and white *Damasin*.

opinion, that it is originally a foreigner of some of the *southern* Countries, and so hardy a Plant, that it still keeps its time of blossoming (which in its own *Country* might be about the end of *December*) though removed hither into a much colder *Climat*. Whether of these is most probable, I shall not determin, but leave every *Reader* best to please himself; and whatever more can be said of it, I shall reserve till I come into *somer-set-shire*, where it is in greatest reputation, and has been most observed.

41. Whereunto perhaps may be added a kind of *Rosa Canina*, which we have ventured to stile, *humilior fructu rotundiori*, for that it wants much of the height and strength of the common one, and has round *leaves*, and the *hips* compressed at the top, and branches thick set with small *prickles* between the great ones; whereas the common one has both *leaves* and *hips* long and pointed, and only a larger sort of *prickles* set at some distance: But whether this be not the *rosa sylvestris folio glabro, flore plane albo*, of *John Bauhin*, to w^{ch} we find it most agreeable of any described *, we dare not pronounce; and therefore have not ventured to give it any draught, but have left it to further enquiry; which that all men may readily make, they may find it growing plentifully in *Magdalene College* water-walks; in the way up *Heddington-hill*; and in many other places near about *Oxford*. And if judged at length to be that of *John Bauhin*: however, we find it not noted by *Mr. Ray*, and therefore cannot be guilty of misplacing it here.

42. Beside this, I met with no others either dubious or omitted, but several of them diseased, discoloured or striped; such as *Periclymenum sylvestre* (with the more accurate *Botanists*, rather a *subfrutex* than a *shrub*) found at *Shotover-hill*; *Cornus femina* at *Waterstock*; *Rubus major vulgaris*, in the Lane between *Finstock* and *Fawler*; and *Sambucus vulgaris*, in the hedges at *Cowley*, and near to *Oxford*; all which are striped yellow, but the last somewhat more remarkably than any of the former, the veins only being yellow, and all the *parenchymous* part of the leaf remaining green, so that the *striping* represents as it were a *Net-work*: but this also growing out after some time like the rest, must be reputed of the same kind, and to proceed from the same cause. Which is all I have found observable under the species of *shrubs*, except it be worthy notice, that in the *Chiltern* part of *Oxford-*

* *Hist. Plant. lib. 14. cap. 1.*

shire the *Rubus Idæus*, Framboise, or Rasp-berry bush, grows plentifully enough among the woods and hills : and the *Oxyacantha*, or Barberry-bush, between *Upper* and *Neither Kiddington*.

43. Thus having dispatch'd both *Herbs* and *Shrubs*, I come at length to the *Trees*, whereof I have met with but *one* undescribed, and that a *narrow leaved Elm*, which also being *smooth*, justly deserves the name of *Ulmus folio angusto glabro*, wherein it differs not only from the *Ulmus minor* of *Parkinson* and *Gerard*, but also from their *Ulmus folio glabro*, whose Leaves they say are nothing so large as the *Wych Hasel*, but nearest in bigness, and exactly in the figure of the *common Elm* ; whereas ours are much *less*, and of a quite different *figure* ; being narrow, and having a peculiar kind of pointed ending, as exactly expressed in *Tab. 10. Fig. 1*. Of those there are plenty in the *Avenues* to the House of the Honorable the Lady *Cope*, the Relict of the most Ingenious Sir *Anthony Cope* of *Hanwell*, where there is a whole Walk of them planted in order, beside others that grow wild in the *Coppices* of the *Park*.

44. As for *Trees* either not noted, or any way doubted, I have met with none here : but of *Trees* remarkable for some unusual accident attending them, there are several worthy notice. For of *Oaks*, though I found none so prodigious as some mention'd by the Learned and Ingenious *John Evelyn* Esq; in his discourse of *Forrest Trees*^h ; yet there is one between *Nuneham-Courtney* and *Clifton*, that spreads from boughs end to boughs end, 81 foot, in circumference supposing the boughs to spread uniformly 243, shading 560 square yards of ground ; under which allowing three square yards for a *horse* or other *beast*, and two square feet for a *man* ; 186 of the *former*, and 2420 of the *latter*, may be shelter'd from the injuries either of *sun* or *rain*.

45. Yet there is a somewhat bigger *Oak* than that, at *Magdalen College*, near the Gate of the *Water-walks*, whose boughs shoot from the boal fifteen or sixteen yards, which supposing they did spread of equal length from the trunk, like the *rays* of a *circle* ; the content of ground on which it would drop, would be no less than 768 square yards, whereof allowing as before, three square yards of ground for a *horse* to stand on (three yards long, and one yard broad, seeming a competent proportion) there might

^h Discourse of Forrest Trees, cap. 30.

256 *horses* stand under that *Tree* ; or allowing as before 2 square feet for a *man*, 3456 *men*.

46. Yet at *Ricot*, in the Park of the Right Honorable the Lord *Norreys*, there is an *Oak* yet somewhat bigger then either of the former, by the *Author* of *Dodona's Grove*, called his *Robur Britannicum*, which extendeth its branches from the trunk of the *Tree* about 18 yards, so that the diameter of its circumference being 36 yards, it takes within its *Area* 972 square yards ; under the umbrage of which *Tree*, upon the afore-mentioned proportions, no less than 324 *horses*, or 4374 *men*, may sufficiently be shelter'd.

47. And these are the *Trees* most capacious without ; some others there are that have given shelter within the hollow of their trunks : Mr. *Evelyn* tells us of one, somewhere in *Glocestershire*, that contains within its bowels a pretty wainscoted Room, enlighten'd with windows, and furnish'd with seats, &c. which I suppose may have given reception to many an honest *Gentleman*. Now though 'tis true we have none put to so Honorable a use, yet the hollow *Oak* on *Kidlington-green*, for the necessary and publick service it has done, ought perhaps to have preference, though neither so great nor gaudy ; it being frequently used before the death of Judge *Morton* (before whose House it stood) for the Imprisoning *Vagabonds* and other inferior *Malefactors*, for the space of a night or so, till they conveniently might be had to the *Goal* at *Oxford* : Of whom, the hollow is so large within, that it would receive eight or ten commodiously enough, the *Tree* without being 25 foot round above the *spurs*.

48. Just such another *Prison* as this, as we are informed by *Johan. Ferdinand Hertoda*ⁱ, was made in *Moravia*, in the trunk of a *Willow* 27 foot round, in the Village of *Moravan*, by a certain Judge of that Country : The extravagant growth of which *Tree*, he attributes to the fertility of the whole *Marquisate* ; whereas I rather think (not but that the Country may be fertile enough) the extream rank growth of that, and of all other *Plants* so exceeding the ordinary course of *Nature*, ought rather to be imputed to some more peculiar agreeableness of the respective soils and *Plants*, than is ordinarily met with in any other places of the same Country where-ever it be.

ⁱ *Tartaro-mastigis Moraviae*, part. 1. cap. 17.

49. On *Blechington-green*, near the *Angel* and *Crown Inn*, there is also an *Elm* of so capacious a hollow trunk, that it once gave reception to a poor great bellyed woman (excluded all the houses in the *Parish*, to prevent her bringing a charge on it) who was brought to bed in it of a Son, now a lusty young man, and living, as they told me, at or near *Harmich*. And yet neither this *Elm*, nor the afore-mentioned *Oak*, are either of them so big, but that they may be match'd in many other places, in so much that I should scarce have thought them worthy my notice, had it not been for the *strange uses* they were heretofore put to.

50. And thus I had immediatly passed on to *Elms*, but that I am detained by a parcel of *subterraneous Oaks*, found some years since at the bottom of a Pond on *Binfield-beath* in the *Parish* of *Shiplake*, very firm and sound, but quite through to the heart as black as *Ebony*; caused I suppose by a *Vitriolic* humor in the *Earth*, which joining with *Oak* the parent of a sort of *Galls*, might reasonably enough produce such an *effect*, as we see they do always in the making of *Ink*: And that I am not mistaken in this conjecture, the Ditches by the Woods side between this and *Caversham* will bear me witness, the Waters whereof, where they stand under *Oaks* and receive their dropings and fall of their leaves, being turned blacker than any *Vitriolic ones* I have any where seen, except those of Mr. *Tyrrill* of *Oakley* in *Buckinghamshire*.

51. And *these* also no question performed the same feat to some Tuns of *Oak* found also under a Pond, belonging to the Worshipful *Thomas Stonor Esq;* of *Watlington-Park*, near *Blunds Court*, in the *Parish* of *Rotherfield Pypard*, which for the benefit of the soil, and other conveniencies, being cleansed in *July*, *Anno 1675*. the Work-men sinking it a convenient depth, came at last, as it proved, to the top Branches of an *Oak*: relation whereof being made to the owner the worthy Mr. *Stoner*, a person not only curious, but equally generous; he presently gave order for a further inquisition, and accordingly employed an equal number of men to the greatness of the work, who sinking a pit about twenty yards over, and about fifty or sixty foot deep, found many whole *Oaks*; whereof one stood upright perpendicular to the *Horizon*, the others lay obliquely, onely one was inverted, the
forked

forked end downward : All of them *dyled* through of a black hiew like *Ebony*, yet much of the Timber sound enough, and fit for many uses, several of the *Trees* being a foot or fourteen inches, and particularly one above three foot *diameter*, and all receiving a very good polish ; and therefore fitter for *Joyners* in-laid works, than *pales* to set about closes, to which use that was put, which was found at *Binfield*.

52. Beside the *Trees*, all along as they dug, they met with plenty of *Hasel-nuts* from within a yard of the surface to the bottom of the *pit*, which Times iron teeth had not yet crack'd ; and that which amazed me most of all, I think they lay thicker than ever they grew : Some of which, as well as the *Oaks* were at some places cover'd with a *bluish substance*, much of the consistence of the flower of *Sulphur*, and not much unlike to the finest *blue starch* ; which is the *Cæruleum nativum* before mentioned in this *History*, Cap. 3. Sect. 18. The *Oaks* had none of them any *roots*, but plainly cut off at the *kerf*, as is used in felling *Timber* ; The shells of the *Nuts* very firm without, but nothing remained within of the *Kernel*, but a shew of the dry outer rind. And the *blue substance* not found only upon the *Nuts* and *Oaks*, but in any other small cavities of the *Earth*, dispersedly here and there all over the *pit*.

53. Moreover, there was found a sort of *white stone* dispersed in like manner, in pieces sometimes as big as ones fist, in colour somewhat like to white *Marble* or *Alabaster*, but of a much different texture. And near the bottom of the *pit* a large *Stags head*, with the *Brow-antlers*, as found as the *Beam* it self, with two *Roman Urns*, both which were broken by the incurious Workmen.

54. How the *Timber* should be thus *dyled* as black as *Ebony*, I hope I have made no improbable conjecture, nor is it liable that I know of to any exception, unless to a *Quære* : Why the *Nuts* and *Stags head* were not *dyled* so too ? To which it may be answered, That the pores of the shells being closer than the wood, and neither the *nuts* nor the *horn* having any thing *gallish*, the *Vitriol* of the *Earth* could have no power on them, whether it be wrought by repugnancy or combination, to work that effect.

55. But how the *Timber* should become thus buried both

at *Binfield* and *Blunds Court*? and at the latter how joyned in so strange a mixture, as *Hasel-nuts*, a *Stags head*, and *Urns*; and at som places only, with an *Alabastrine* kind of substance? remains yet a knot not so easily loosed. However, since attempts have somtimes pleased, and it has always been acceptable in *magnis voluisse*, I shall adventure to propound my present thoughts; still reserving the liberty to my *self*, as well as *Reader*, of thinking otherwise when sufficient grounds of change shall offer themselves at any time hereafter.

56. First then, as for the *timber* dug at *Binfield-heath*, 'tis likely that might be fell'd and buryed there when *Societies* of *men* (which I guess was not common till the days of King *Alfred*) under some *Mean*, or *Lord Paramount*, first chose to themselves certain places of abroad, and promoted *Agriculture*: which that they might the better do, they fell'd and buryed the *timber* which they could not well burn with the *under-wood*. Thus, as I have been informed by a very worthy Person, who had it from his aged *Father*, did our *Grand-fathers* serve their *timber* in the inland parts of *Kent* to make room for *tillage*, digging a trench by each *tree* after it was fell'd, and so tumbling it in, its sale not being worth the portage, even there, so few years ago. Much rather therefore might the first *Planters* of *Binfield-heath* throw it into Ponds, or other hollow places ready at hand, to make room as well for *habitation* as *tillage*, in ancienter times: which I guess might be done in the Reign of King *Alfred*, 1. because he divided the *Kingdom* into *Shires* and *Hundreds*; and 2. because *Binfield* gives name to the *Hundred* (however inconsiderable it be now) in this woody part of the *County*.

57. Moreover, that this *Timber* must be buryed by design, and not casually over-thrown, either by their *roots* being loosen'd by to much wet, occasioned by the obstruction of *Rivers*, as *Camden*^k apprehends those *Trees* were, found in *Chatmoss* in *Lancashire*: Nor by the over-flowing of any *Rivers*, nor fall of any *Torrent*, as *Steno* would have it^l: Nor undermined by *subterraneous streams*, or dissolution of matter underneath them, as Dr. *Jackson*^m thinks it happened about 18 years since at *Bilkely* in *Hereford-shire*, is plain and evident; for that all the *Country* here-

^k *Camden* in *Lancashire*. ^l *Steno* in *Prodom*. concerning the matter of beds. ^m *Philosoph. Transact.* Num. 53.

about lies very high, and is as stony a fast ground, as almost any where to be found.

58. It remains therefore, that it must needs be designedly buried, and if in any other places of the *beath*, as well as in the *pond*, may possibly be discover'd either by the *herbage* over them, which will wither much sooner than any of the rest; as near *Teovil* in *Somerset-shire*, where, as we are informed by the Reverend and Learned Dr. *Beal*^a, the parched part just over them, will bear the very length and shape in gross of the *trees*, whence they have been instructed to find and take up hundreds of *Oaks*: Or by the direction of the *dew* in Summer; it being observed in *Cumberland*^o, that the *dew* never stands on any of the ground under which such *trees* lie; though possibly too, on the other side we may have no such *indications* here in firm grounds, they being hitherto observed only in *moors* and *mosses*.

59. But as for the *timber* at *Blunds Court*, as it was found, so it requires a deeper research, it being very unlikely they should dig so low, upon the same score as at *Binfield*, since *timber* might have been buried on far easier terms, as formerly in *Kent*. Much less can it be admitted it should be swallowed by an Earth-quake, or as the *vulgar* will needs have it, thus cover'd with Earth by the violence of a *Flood*, and particularly by that in the days of *Noah*. For in either of those cases, we should have found each *tree* with *roots* as well as *branches*, whereas these were plainly hewen off at the *Kerf*, as is used in felling *Timber*, the marks of the *Ax* still remaining upon them.

60. Beside, the several other *things* found in company of these *trees*, seem to give testimony of some other *matters*. The first and chiefest whereof, is that blewish kind of substance; which I am strongly perswaded is *Ceruleum nativum*, and the rather, because found in an *Ash-colour'd* Earth. The true *Cyprian Ceruleum*, or *Ultramarine*, as is testified by *Rulandus*, being found in *terra cinerea*[;] and the *Ceruleum Patavinum*, in *glebis subcinereis*^p; with whom agrees *Kentmannus*, as cited above, Chap. 3. §. 18. And if true *Ceruleum*, we have reason to suspect a *Mine* underneath; for then, says *Aldrovandus*, is *Ceruleum* produced, when some saline acid humor (such as the *Vitriol* that dies the *Trees*

^a Philosoph. Transact. Numb. 18. ^o *Britannia Baconica* in *Cumberland*. ^p *Mart. Ruland. Lexic. Alchemia*.

black) corrodes some *metallick* matter or other^a; which sometimes is *Copper*, and sometimes *Gold*, as *Encelius* witnesseth it is at *Lauterberg* and *Goldeberg* in *Silesia*, in his Book *De re Metallica*^r; where he also further adds, that *Gold* is smelted out of *Ceruleum* it self.

61. Dr. *Brown* also tells us, in the account of his Journey from *Comara* to the Mine-Towns in *Hungary*^s, that at *Schemnitz*, where the *silver* Ore holds some *gold*, and at the *silver* Mines in *Peru*, there are Rocks cover'd over with a fair shining blue. *Rulandus*^t also joins it with a *silver* Ore at *Gieshubelia*, and so does *Pliny*^u: What then should hinder but it may be so here? since I do not doubt it to be the steam of a *mineral*; for when I was at the bottom of the *pit* (above 50 foot deep) notwithstanding the openness of the *pit*, and coolness of the day, no Sun appearing, I found it so *hot*, that the drops followed one another on my face, whence I judg'd the *Mine-chamber* not to be far off.

62. Which I rather guess to be of *silver* than of any other *metal*, because of the *Alabastrine* or *spar-like* substance found mix'd with it; which, says Mr. *Webster*, was in some places intermixt also in the best *Silver-mine* ever yet found in *England*, the Ore whereof held about sixty six pounds *per Tun*^w. From all which it may be concluded, that 'tis probable at least that here may have been formerly such a *mine*, stopt up as I first thought by the *Aboriginal Britans*, upon the arrival and conquests of the *Romans* or *Saxons*, who not being able to recover their *Country* within the memory of man, it might be lost like the *Gold-mine* of *Glass-Hitten* in *Hungary*, when *Bethlem Gabor* over-ran that *Country*^x; or the *Gold-mine* of *Cunobeline* in *Essex*, discover'd again *temp. Hen. 4.* as appears by the Kings Letters of *Mandamus*, bearing date 11 May, An. 2. Rot. 34. directed to *Walter Fitz-Walter* concerning it^y; and since that lost again.

63. Till at length they found the *Urns*, and then 'twas plain and evident that it must have been formerly some *Roman Work*, and probably still remains some old *Roman Mine*, in all likelihood stopt up, when *Gallio* of *Ravenna* sent hither with a *Legion* (the last that ever was in *Britan*) to repel the *Picts* and *Scots*, was fi-

^a *Museum Metallicum*, lib. 3. cap. 8. ^r *Encel. de re Metallica*. cap. 22. ^s Account of his Travels, p. 93, 94. ^t *Mart. Rulandi Lexicon Alchemie*. ^u *Nat. Hist.* lib. 33. cap. 12. ^w History of Metals, cap. 13. ^x Dr. Brown's Travels into Hungary. ^y Sir John Pettus his *Fodinae Regal*. cap. 9. & 13.

nally recalled by *Valentinian* the third, to assist *Ætius* in *Gallia* against the In-roads of the *Francks* under *Clodion*, and to support his then tottering, and quickly after ruin'd *Western Empire*: At what time, says Mr. *Speed*² (but he quotes not his Author) they buryed also their *Treasures*, whereof we have found parcels in all Ages ever since.

64. And this 'tis likely they might do, first by throwing in *Trees*, which not lying close enough immediatly to support the *Earth*, were after cover'd with *Hafels* (when the *Nuts* were fully ripe, which has occasioned their endurance to this very day) on which they heaped *Earth*; which after some time sinking below the surface of the other ground might occasion this *Pond*, never thought to have been any other till the time above-mention'd.

65. After the *accidents* of *Oaks*, come we next to those of *Elms*, whereof there stands one on *Binsey-Common*, at the *spurs* next the ground at least 6 yards *diameter*, occasion'd here, as (I suppose) at many other places, by erecting a Turf seat round the bottom of the *Tree*, it being elsewhere but of ordinary dimensions. But this is not so extravagant in the excess of the growth of its *trunk* near the ground; but there is another more strange for a defect in that place, *viz.* a great old *Elm* growing near the North-east corner of the Bowling-green in *Magdalene College Grove*, disbarked quite round, at most places two foot, at some at least a yard, or four foot from the ground; which yet for these many years past has flourish'd as well as any *Tree* in the Grove.

66. Now how this should come to pass (all *Trees* being believed to receive their nourishment between the *wood* and *bark*, and presently to die upon their separation) many have admired, but few attempted to explain, being further discouraged by the absence of the *pith*, the *Tree* being within as hollow as a *Drum*, and its outmost surface, where unbark'd, dead and dry beside. All which I think had not startled me much, but that I found it in our *Transactions*³ positively asserted, that if any circle be drawn round any common *English tree* (only *Ash* excepted) as *Oak*, *Elm*, *Poplar*, &c. by incision to the *timber* (how thin soever the knife be) so that no part of the *rind* or *bark* to the very solid *timber* be uncut, the *Tree* will die from that part upwards.

² History of Britan. lib. 6. cap. 54. ³ Philosoph. Transact. Numb. 43.

67. For the better clearing of which point, and avoidance of the attending *difficulties*, it will be but requisite, though two principal parts of our *tree* be wanting, to represent in *Sculpture*, at least a *sextant* of the body of an *Elm* cut transversly, together with the *bark* and *pith*, as well as the *wood*, as they all appear in a *Microscope*: Which without further trouble, or suspicion of falsehood, I have carefully taken out of the *Anatomy* of *Trunks* lately publish'd by the accurate and ingenious Dr. Grew, as in *Tab. 10. Fig. 2.* only with some alteration of the *Letters* of *direction*. Wherein

AB, CD. represent the whole bark of the tree.

AB. the skin of the bark.

CD one kind of sap vessels.

EF. another kind of sap vessels.

GH. the parenchyma of the bark wherein the *Vesiculæ* are so exceeding small, as difficultly to be perceived by the *Microscope*.

IK, LM, NO, PQ. the great air vessels postured chiefly in rings on the inner verge of every annual growth of wood.

rs, rs, rs. the small air vessels postured in cross bars.

TVW the pith.

XY. the diametral portions, or insertions runing through the several annual rings from the pith to the bark;

zzzz. the true wood, having been originally the sap vessels of the bark.

now the *sap vessels* in this *diagram* being only to be found in the *Bark*, and those *passages* intercepted at so great distances, as above-mention'd in our *Elm*, the great *question* still returns as difficult as before, and as far from solution.

68. In the clearing whereof, it must first for certain be answer'd, that its a great mistake (though it have obtained so long) that a *tree* only lives by the ascent of its nourishment in or between the *Bark* and the *Wood*, and that *trees* must needs die when once they are bark'd round, here being matter of fact to confute those *opinions*. And secondly, That it is as certain a *truth* as the other is a *mistake*, that an *Elm* as well as an *Ash*, or any

any other *tree*, whatever Experiments may have been made, may and do's sometimes live after 'tis disbarked; and that therefore there must be other *vessels*, beside the *sap vessels* of the Bark, capable of the office of conveying *sap*, sufficient not only for the life, but flourishing condition of a *tree*.

69. And such perhaps are a sort of small *vessels* in the very *schematism* of the *wood* at zzzz, not perceptible by a *Microscope*, it being on all hands agreed on, that the whole *wood* of *trees*, was all heretofore the *sap vessels* of the Bark: The Bark every year, as Dr. Grew^b well observes, dividing into two *parts*, and distributing it self two contrary ways; the *outer* part falling off toward the skin at A B, and becoming at length the skin it self; and the *inner* part adding it self to the *wood*, the *parenchymous* part thereof making a new addition to the *Insertions* at X Y, and the *sap vessels*, a new addition to the *lignous parts* at zzzz standing between the *Insertions*: So that a Ring of *sap vessels* in the Bark this year, becomes a Ring of *wood* in the *tree* the next; all which may be perfectly seen in the great *Oak* afore-mentioned, (§. 45. of this *Chapter*, and belonging to the same *College*) at several places where the rind is bruised off.

70. And if so, not unlikely they may so far retain their ancient office of conveying *sap*, as to keep a *tree* alive, though not augment it, which perhaps may be one different use of these *sap vessels* in the *wood* from those in the *bark*, these being sufficient for the *continuation* of a *tree*, and the others serving only for its *augmentation*: Which if true, and our *tree* past its increase, as no doubt it has been many years since; what need has there been of any such thing as the *sap vessels* of the *bark*? or indeed of the *bark* it self?

71. Now that this indeed is certainly so, seems agreed on and confirmed by the learned and ingenious Mr. Willughby and Mr. Ray^c; who have made it appear by irresistible *experience*, that the *sap* not only ascends between the *bark* and the *tree*, but also through the very substance of the *wood*: And by the accurate Dr. Grew^d, who allows to the *wood*, as well *sap vessels* as *air vessels*, it being proper to the *bark* to have *sap vessels* only. All which put together, seem abundantly to dispel all appearing dis-

^b Compar. Anatom. of Trunks, c. 3. ^c Philosoph. Transact. Numb. 43. ^d Comparat. Anatom. of Trunks, cap. 8.

faculties, and no question will satisfy all unprejudiced *Readers* how our *tree* comes to flourish, though disbark'd all round.

72. But if there shall be any found so froward, as not to allow (against all experience) those minute *sap vessels* in the substance of the *wood*, yet the visible *prick'd circles* between the *annual coats* of the *wood*, observed also by Mr. *Willughby*, Mr. *Ray*, and Dr. *Tong*^e, which I suppose may be the large *air vessels* of Dr. *Grew*, may be sufficient for this purpose; especially in *Elm*, where they are numerous and of two sorts, as in *Tab. 10. Fig. 2. IK, &c. rs, &c.* It being the office of *air vessels*, for about a month in *March* and *April*ⁱ, before the new *sap vessels* of the *bark* are fit for use, to convey the *sap* necessary for the *vegetation* of all *Plants*. And if so, in old *trees* that have done growing, and have no need of the *annual* new production of a *bark*, why may it not continually ascend by them still?

73. To which if it be objected, that a *tree* lives as well by *vegetable air* as *sap*, and that if the *air vessels* be continually fill'd with *sap*, the *tree* must dye on the other side for want of *air*: It may easily be replied, that the use of the *Insertions* or *Diametral portions*, *Fig. 2. X Y*, interceding the *pith* at *T V W*, and the *parenchyma* of the *bark* at *G H*, all made of small kind of *bladders* cluster'd together, is for conveyance of *air*, as well as the *air vessels* themselves. But if it be further urged, that the *Diametral portions* only serve to convey it by the *breadth*, and not the *length* of the *tree*, which makes them insufficient for this purpose; we have latitude enough, and can allow the *lesser sap vessels* that lye in cross bars at *rs* to supply that defect, and still retain all the ranges of the great *air vessels* at *IK, LM, NO, PQ*, for conveyance of the *sap*, in such like *Trees* as our old *Elm*.

74. And if it be further enquired, how it comes to pass that some *trees* do dye upon the loss of their *bark*, and all are not preserved by the help of the *sap*, or *air vessels* of the *wood*: It may be answer'd, and probably rightly enough, that such *trees* as are young, a growing, have a plentiful issue of thin *sap* between the *bark* and the *wood*, and that readily bleed when they are wounded or bored, do most commonly (if not always) certainly dye: whereas some of the same *trees* when older, past growing, especially if they have a more gummy juice, such as *Ash*, *Elm*, *Lime-*

^e Philosoph. Transact. Numb. 43. & 48. ⁱ Dr. Grew of the vegetation of Plants, cap. 1.

tree, &c. may live and flourish many years after their disbarking, by the *saps* ascent through the *sap* or *air vessels* of the wood.

75. Moreover, amongst the *accidents* that have happen'd to *Elms*, I must not forget a very pleasant one that fell out at *Middle-Aston*, where cleaving of *Elm* blocks at one Mr. *Langston's*, there came out a piece so exactly representing a shoulder of *Veal*, that it was thought worth while to preserve it from the fire by the owner of it, by whom it was kindly bestowed on me, as an addition to the rest of my *Curiosities of Nature*.

76. But the most remarkable *accidents* that ever beset *trees*, perhaps here, or in any other *County*, were the *foundations* of two eminent *Religious houses* both occasion'd by *trees*. The first, *Oseney Abby* founded in that place by *Robert D'Oyly* the second, by reason of a certain *tree* that stood in the *meddows* where after he built the *Abbey*, to which it seems repaired a company of *Pyes*, as often as *Editba* the wife of *Robert* came to walk that way, which in company with her *maid* she often used to do (as *Leland* expresses it) to solace *her self*: at whose arrival the *Pyes* were alwaies so *clamorous*, that *she* took notice of it, and consults with one *Radulphus Canon* of *St. Frideswid's*, what this might signifie: who cunningly advises, that she must build some *Church* or *Monastery* where the *tree* stood, which *she* instantly procures her *Husband* to do, and this *Radulphus* (her *Confessor*) to be made the first *Prior*.

77. What *tree* this was, *Leland* acquaints us not; but that which occasioned the second *Foundation* in the place where it is, was a *triple Elm*, having three trunks issuing from one root. Near such a *Tree* as this *Sir Thomas White*, Lord Major of *London* (as we have it by Tradition) was warned in a *Dream* he should build a *College*, for the education of Youth in Religion and Learning: whereupon he repairs to *Oxford*, and first met with something near *Glocester-Hall* that seem'd to answer his *Dream*, where accordingly he erected a great deal of Building. But afterward; finding another *Elm* near *St. Bernards College*, suppress not long before by King *Hen. 8.* more exactly to answer all the circumstances of his *Dream*, he left off at *Glocester-Hall*, and built *St. John Bapt. College*, which, with the very *Tree* beside it, that occasion'd its *Foundation*, flourishes to this day, under the *Presidence* of the Reverend and Learned *Dr. Levinz*, a cordial promoter of this *Design*.

78. Beside the *Elms* at *St. Johns* knit together at the *root*, there are two *Beeches* in the way from *Oxford* to *Reading*, near a place called *Cain-end*, more strangely joined together a great height from the ground: for the bodies of these *Trees* come from different roots, and ascend parallel to the top, but are joined together a little before they come to bough, by a transverse piece of timber entering at each end into the bodies of the *Trees*, and growing jointly with them, for which reason 'tis commonly called the *Gallow-tree*, though the piece that intercedes them lies somewhat obliquely: How this should come to pass many have wondered, but the problem I guess may be easily solved, only by allowing the transverse piece of Timber to be one of the boughs of the *Tree* to which its lowermost end still joins, which whilst young and tender, might bear so hard against the body of the neighboring *Tree*, that with the continual motion of the wind, it might not only fret it self asunder, but gall off the *bark* too of the other *Tree*; which closing up again in calm weather at the rising of the *sap*, might well include so near a neighbor, first within its *bark*, and after some time within the *wood* it self: which I have observed to have been done but very lately in *New College* Gardens, where the boughs of two different *Sycomores* are thus grown together, only by bearing hard on one another, and interchangably fretting away each others *bark*, and then closing up again at the rising of the *sap*.

79. There have also some *accidents* befallen the *Ash* and *Willow*, not commonly met with; the former whereof in a Close of one *Mr. Coker*, of the Town of *Biffeter*, grows frequently out of the boal of the other, yet not as 'tis usual amongst other *Trees*, but so that the roots of the *Ashes* have some of them grown down through the whole length of the trunks of the *Willows*, and at last fastening into the earth it self, have so extended themselves that they have burst the *Willows* in sunder, whose sides falling away from them and perishing by degrees, what before were but the *roots*, are now become the *bodies* of the *Ashes* themselves. But this happens only to *Willows* that have been lopt at six or seven foot high; the *willows* at *Enston*, in the walks near the *Rock*, whereof there are several about 50 foot high, being incapable I suppose of any such *accident*.

80. Beside this unusual growth of the *Ash*, I have met with
other

other *accidents* that frequently attend it, which because so much commended by *Pliny*^b in *Maple*, in which they are common, I think ought much more to be noted in this: And such are the *Nodosities* called *Bruscum* and *Molluscum*, to be found in *Ash* as well as *Maple*, which when cut, shew a curled and twining grain; the *Bruscum* thick and intricate, the *Molluscum* being streaked in a more direct course. With the *Molluscum* of *Ash* there is a whole Closet wainscoted, at the much Honored Mr. *Stonor's* of *Watlington* Park, the grain of the panes being curiously waved like the *Gamabe's* of *Achats*. And at the Worshipful Mr. *Reads*, of the Parish of *Ipsden*, the *Bruscum* of an old *Ash* is so wonderfully figured, that in a Dining-table made of it (without the help of *fanfie*) you have exactly represented the figure of the Fish, we commonly call a *Jack*, though endeavoring to *mend*, they have somewhat *marr'd* it by *Art*: and in some other *Tablets* the figures of a *Unicorn*, and an old *Man* from the navel upwards, but neither of these so plain as the former.

81. *Jacobus Gaffarellus*, amongst his unheard of *Curiosities*ⁱ, tells us of a *Tree* found in *Holland*, which being cut to pieces by a wood-cleaver, had in one part of it the figure of a *Chalice*, in another that of a *Priests Albe*, in another that of a *Stole*; and in a word, there were represented very near all the *ornaments* belonging to a *Priest*: which relation if true, says he, it must needs be confest, that these figures could not be there casually or by chance; and indeed 'tis very hard to think, how so many things pertinent to the same *office*, should thus meet together without some design of *Nature*. However, till I am better satisfied of the truth of the thing, or convinced by the sight of some other such *Curiosity*, I cannot afford to think ours (being altogether independent) more than meer *accidents*.

82. Beside these unusual *accidents* of whole *Trees*, or their *Trunks*, there are some also that have happened to their upper branches and leaves, whereof the former are sometimes *fasciated*, and the latter *striped*. In *willows*, and some other of the softer woods, the uppermost boughs are commonly *fasciated*, but the best of the kind I ever yet saw, was the top-branch of an *Ash*, which I met with at *Bisseter*, not only *fasciated*, but most uniformly wreathed two or three times round. And there is a good example of this

^b Nat. Hist. lib. 16. cap. 16. ⁱ Unheard of *Curiosities*, chap. 5.

nature, in a top branch of *Holly* hanging up in the Gate-house of the *Physick-garden*, whence 'tis plain, that this happens also to the hardest woods; and in both, by the ascent of too much nourishment, though in branches of *Trees*, especially such as are not only *flat* but *belically* curled, I guess there concurs some blast, or some such like matter, that contracts the *fibers* and so turns them round, beside the excess in the ascent of their nourishment.

83. As for the striped leaves of *Trees*, as well as those of *Shrubs*, and *herbaceous Plants*, I suppose they may be met with almost in every *kind*. The greater *Maple*, miscalled the *Sycamore*, was found striped white not many years since in *Magdalen College Grove*, and translated thence into the *Physick-garden*, where it flourishes still and retains its *stripings*; and I hear of a *striped Elm* somewhere in *Dorset-shire*. Dr. *Childrey*^k, and out of him the ingenious Mr. *Evelyn*^l, inform us of an Oak in *Lanbadron Park* in the County of *Cornwall* (to omit the painted Oak in the Hundred of *East*) which constantly bears leaves speckled with white. And there was another of these found this instant year, 1676. by my worthy Friend Dr. *Thomas Tayler*, in a place called *Frid-wood*, in the Parish of *Borden* near *Sittingbourn* in *Kent*. But of these more hereafter, when I come into those *Counties*.

84. Of *Unusual trees* now cultivated in *Oxford-shire*, there are some remarkable; such is the *Abele-tree*, advantageously propagated by Sir *George Croke* of *Waterstock*, which he does, by cutting *stakes* out of the more substantial part of the wood, which put into moist ground grow more freely than *willows*, coming in three or four years time to an incredible height. And such are the *Fir-tree*, and the lesser *mountain Pine*, whereof there are several *Nurseries* planted in the *Quincunx* order, at *Cornbury*, in the *Park* of the Right Honorable the Earl of *Clarendon*, which they propagate by *slips* twisted, as well as by *Kernels*, to that advantage that there is great hopes of beautiful and stately *Groves* of them; such as I met with at the Right Worshipful Sir *Peter Wentworths* at *Lillingston Lovel*, where there are three Walks of *Firs*, most of them 20 yards high.

85. Which Parish, if the Reader look for in the Map of *Oxford-shire* he must not expect to find, though it belong to the County,

^k *Britannia Baconica in Cornwall.* ^l Discourse of Forest Trees. cap. 3.

it lying five miles within *Buckingham-shire*: as on the other side several Parishes of *Berkshire*, *Buckingham-shire*, and *Worcestershire*, are placed within *Oxford-shire*. How these things come to pass we have little of certainty, but in all probability this *Lillingston* was accounted in *Oxfordshire* for the sake of the Lords *Lovels*, whose Inheritance, from the addition, we may conclude it once was; who being powerful men in these parts, and not unlikely most times the *Kings Lieutenants*, might have permission to reckon this their own *Estate*, within their own Jurisdiction as part of *Oxford-shire*; as I suppose all other *Parishes* thus placed out of the body of their *Counties*, may also have been.

86. From this necessary, and therefore I hope pardonable digression, I proceed to some *Fruit-trees* not ordinary elsewhere; such as the *double-bearing Pear-trees*: whereof I met with one in the Parish of *Haseley*, at a place called *Latchford*, in the *Hort-yard* of Mr. *Gooding*, called the *Pear of Paradise*, whose first Crop is ripe about *Midsummer*, and the second at *Michaelmas*. There is also another of these, but of a different kind, in the Parish of *Stanlake* at the *Chequer-Inn*, called the *Hundred-pound Pear*, which Blossoms at two distinct times, and bears two Crops; whereof it has both sorts (much like the Fig) upon the Tree at a time, some ripe, and others green. But in both these trees, the Pears in the second Crops are somewhat less than of the first, and grow both after a peculiar manner, most of them, if not all, coming forth at the ends of the twigs, which are all the pedicles they seem to have; and therefore on the tree they do not hang downwards, like those of the first Crop, but point up in the air, or any other way the shoots direct them.

87. At *Corpus Christi College* they have a sort of *Pear-tree*, that bears Fruit in hardness little inferior to the younger shoots of the very tree that bears them; and therefore not undeservedly by some called the *Wooden-pear*, though in wet years I have known them pretty soft: but generally they are so sound, and of so unalterable a constitution, that I have now some by me that were seasonably gather'd, above ten years old, as hard and firm as ever they were at first, only somewhat less than when first gather'd; for which very reason, in some parts of *Worcestershire* where they have plenty of them, they are called *Long-lasters*, being not subject to rot like other *Pears*.

88. And thus I had finish'd the Chapter of *Plants*, but that I think fit to acquaint the *Reader* of a further design I have concerning them, *viz.* Of enquiring hereafter into some other *accidents* of *Plants* of an inferior quality to any before mentioned ; which yet perhaps are more abstruse in their consideration than the more noted ones are. And such are the *blebs* or *blisters* we find on the leaves of many *Trees* and *Shrubs*, which sometimes happen to them after heat and droughts, and sometimes too upon cold nipping weather : but whether thus infected from the *air* from without, or by *juices* within, or by *both* ; and when by one, or the other, or both together ? is a *Question* requires a great deal of time, and more sedulity than has yet been afforded, to be but probably solved.

89. And this I the rather design, because all that I find certain concerning them yet, is only that the weak, and free growing sappy *Trees* are most subject to them, and the stout *Ever-greens* but little, if at all : that the *infection* for the most part is under, and the *blisters* above the leaf, but sometimes otherwise : that the *blisters* sometimes have *Insects* in them, sometimes bear *fungus's* on their tops¹, and sometimes have neither : But what kind of *Insects* or *fungus's* they are, that belong to each *Plant* that have them ? or whether the same *Plants* have not sometimes different *Insects* and *fungus's*, especially in dry, and wet years ? are also *Questions* that require indefatigable industry, to be in any measure satisfied.

90. And yet even in these, if *God* give me life, and I find encouragement to proceed in my *undertaking*, I intend to attempt something. As also to find out how it comes to pass, that of the *seeds* of many *Plants*, such as *Oak*, *Ash*, *Elm*, *Beech*, *Yew*, *Juniper*, *Hemp*, &c. there come some *Plants* again that will never bear *seeds*, if not timely prevented by our Learned *Professor* of *Natural Philosophy*, the Ingenious Dr. *Millington* ; the Learned Dr. *Morison* our *Botanic Professor* ; or the Learned and accurate Dr. *Grew*, now reading, writing, and practising the *Anatomy*, of *Vegetables*.

¹ See Mr. *Hook's* Micrograph. Observat. 19.

CHAP. VII.

of Brutes.

HAVING done with the *Vegetative*, I proceed to the *Animal Kingdom*, wherein I shall consider first, that part of it that indeed has *apprehension* of external *Objects*, of *Pleasures* and *Pains*, and *Locomotion* to make address to the *one*, and fly the *other*, but is void of *reason*; within which may be comprehended all manner of *Brutes*, such as *Birds*, *Insects*, *Fishes*, *Reptils*, and *four-footed Beasts*, which I presume may be a *subject* sufficient for this *Chapter*, though as in the former of *Plants*, I intend only to mention *such*, as either have not been *noted before*, are very *unusual*, or have something *extraordinary* attending them; Leaving what concerns *Men* for a *Chapter* by it self.

2. And herein, as before in the *Chapter* of *Formed stones* (and as I intend for the future in all other *Chapters* so far forth as they will bear it) I shall observe the *method* of the whole *Essay*, and first treat of such *Animals* as are *Inhabitants* of the *Heavens*, then of those that belong to the *Waters*, and lastly of such as inhabit the *dry Land*; of which in their order.

3. But amongst the inhabitants of the *Air* or lowermost *Heaven*, it cannot be expected in so small a *County*, I should produce *many* not already noted, since the *feathered Kingdom* has been so lately and so carefully surveyed, by the *Learned* and *Industrious Francis Willughby Esq*; Nor indeed could I meet with any omitted by him, except perchance a *little Bird*, sometimes seen, but oftner heard in the *Park* at *Woodstock*, from the noise that it makes, commonly called the *Wood-cracker*: Described to me (for I had not the happiness to see it) to be about the bigness of a *Sparrow*, with a *blue* back, and a *reddish* breast, a *wide* mouth and a *long* bill, which it puts into a crack or splinter of a rotten bough of a *Tree*, and makes a noise as if it were rending asunder, with that violence, that the noise may be heard at least *twelve score* yards, some have ventured to say a *mile* from the place.

4. Which is all I could find in the *County* of *Oxford* omitted by that careful and ingenious *Author*, except I may have leave to
number

number the *Diabolus marinus*, or Sea Devils-bird mention'd by *Johnston*^m, and others, and to be seen in the Repository of the *Bodleian Library*: Which though it has so ill a name, contracted I suppose from its *exquisite* blackness, and the ill it bodes to *Sea-men* whenever they see it; yet is a very beautiful *Bird*, and has therefore by some been numbered amongst the *Manucodiata*'s, and called the *black Bird of Paradise*. But of this no more, because no inhabitant of the *Land*, much less of this *County*.

5. Which yet I think I had not forbore to describe, had our *Bird* been perfect, it not being to be found in *Sculpture* in any *Author* that I know of: For though I did it not in *Foreign* undescribed *Plants* growing in our *Gardens*, well knowing the much abler *Dr. Morison* to be about it: Yet I think I may take the liberty to do it in *Animals*, not hearing of any body else now designing such a work.

6. And therefore shall not omit the *Hen* from the *Isle* of *St. Helen*, now living, and in the possession of the Right Honorable the Lord *Norreys*, a great lover of *Curiosities* in all sorts of *Animals*: which for her kind I think may be accounted one of the *γαμφώρυγες*, and amongst them of the rapacious, carnivorous sort, having her *beak* near its end, crook'd after the manner of a *Vultur*, and striking with her *pounces* like a *Hawk*, though her *talons* indeed are not much more turned than those of a common *house Hen*.

7. In her *head*'tis true she is somewhat like the second sort of *Gypaëtos* of *Aldrovandus*ⁿ, or the *Percnopteros* of *Johnston*^o, being bald and wrinkled, but not quite to the hinder part of the *head*, as they are said to be; having from the crown of her *head* down to the beginning of her *neck*, and so behind her *ears* to her *throat*, a sort of slender *plume*, like *bristles*, which she erects or lets fall at pleasure: in her *gorge* also and *pounces* she is very unlike them, for though she be *carnivorous*, yet her *gorge* is slender, and though she strike with her *pounces*, they scarce exceed in bigness those of a common *house Hen*, whereas the *gorge* and *pounces* of the *Gypaëtos*, and *Percnopteros*, are protuberant and very long; nor has she like them any part of her *plume* so disposed at the top of her *back*, as to represent a *Monks hood*, thrown backward from his head^p.

^m De Avibus, lib. 4. tit. 2. cap. 4. ⁿ Ornitholog. Tom. 1. lib. 2. cap. 10. ^o Hist. Nat. de Avibus, lib. 1. Tit. 1. cap. 2. Art. 4. ^p Vid. Willughbeii Ornitholog. lib. 2. cap. 3. Artic. 8. & Tab. 4.

8. However, for her near resemblance of them in her *head*, and some other *parts*, we cannot but allow her to be a Bird of that *genus*, though undescribed; and accordingly advise, she may be placed amongst them by future *Ornithologists*, to which purpose let them take the following description.

9. Her *beak* is straight, only at its extremity, where it is turned like the *Vulturs*, in length 2 inches $\frac{3}{4}$, and her *Nares* long and narrow, as in *Tab. 10. Fig. 3.* The *pupillæ* of her *eyes* are full and black, encompassed with *Irides* of a dark brown colour, bald and wrinkled to the top of the head, and so round by the *ears* (which are of an irregular *oval* form) next which stand the *pennæ setiformes* as aforesaid; her *gorge* not at all protuberant, but slender; her wings complicated or folded to her body, reach almost to the end of her *train*, and extended at full stretch, have their extremities distant about five foot, being somewhat larger than those of a *Lanar*, and containing in each of them 34 *Remiges*, *i. e.* beside the five *feathers*, 29 at least or 30 *flags*: her *thighs* and *pounces* are much like those of a common *house Hen*, having the outermost *talon* knit to the rest by a *membran*. In the whole, she is bigger than a *Moscovy Goshawk*, from the point of her *beak* to the extremity of her *train*, above two foot long, her *plume* for the most part being of an Ash-colour, mixt with some white feathers, and growing whiter upon *mewing*, as those of *Hawks* do.

10. Other *Birds* there are *here* that are but rarely seen, yet breed in this *Country*, and are continually with us, and therefore to be numbred amongst those we call *perennial*. Such are the *Upupa* the *Hoopoe*, or *Hooping-bird*; whereof I saw one alive on *Otmoor*, and another was given me for the *Repository* of the *Bodleian Library* (killed somewhere about *Cassenton*) by one Mr. *Painter* Alderman of *Woodstock*. A Bird it is to admiration beautiful, being curiously deck'd with feathers of divers colours, and with a large *crest* on its head, as it is exquisitely engraven both by Dr. *Charleton* * and Mr. *Willughby*; but like the *Diabolus marinus*, never appearing or being heard (as the *vulgar* will have it) till immediately before some approaching calamity.

11. As for Birds that have casually flown hither, or come but at some certain *seasons* of the year, by *Naturalists* stiled *Aves mi-*

* *Onomast. Zoicon. Titul. Aves, Classe Conoratum.*

gratoria, beside *Swallows*, and some well known winter Fowl: The *Cormorant* has been observed to come hither about *Harvest* time, whereof there was one killed from *St. Maries* steeple (tired with a long flight) *An.* 1675. and another young one taken up in *Arncot-field* fallen down in the Corn, and brought me to *Oxford*.

12. But what is somewhat stranger, in the year 1644. the *Pica Brasiliensis*, or *Toucan*, whose *beak* is near as big as its whole body, was found within two miles of *Oxford*, and given to the *Repository* in the *Medecine-School*, where it is still to be seen; which argues it a *Bird* of a very *rank* wing, there being a necessity of its flying from *America* hither, except we shall rather say it might be brought into *England* by Ship, and afterwards getting away might fly *hither*.

13. Of *Birds* well known of *unusual* colours, I have met with two remarkable examples: the one a white *Linnet*, given me by Mr. *Lane* of *Deddington*; and the other a sort of *white*, and *pyed* *Pheasants*, kept by the Right Honorable *James Lord Norreys* of *Ricot*: Whereof how some happen to be of different colours from the rest of their *species*, especially when they have deviated from their kind by *whiteness*, hath been a *question* thought worthy of severe examination. In the prosecution whereof, it hath been observed (as before in the *Chapter* of *Plants*, §. 38.) that *whiteness* often proceeds from a defect of moisture or nourishment; and it hath been a received opinion concerning *Birds*, that they may become *white* by plucking off their first feathers, which will cause their new ones to come forth of *that* colour. But beside these ways of *art* and *privation*, it is manifest that *Nature* her self sometimes positively designs such a colour, even in *species* too that seldom are of it, many other *Animals* as well as *Birds*, having been produced of *that* colour unusual to the *species*, as brisk and well liking as any others whatever, such as *white Moles*, *Rats*, *Mice*, and sometimes *white Fawns*, where there has been neither *Buck* nor *Doe* of that colour in the Park.

14. And this I guess she does by giving some certain *Individuals* of each *species* a skin of finer and more contracted pores than others, which will cause *whiteness* in feathers, hair, &c. by not permitting of the *sulphureous particles* to expire, which give *variety* of colours^a; thus we see in the *cicatrization* of wounds where

^a Vid. Willisium de Ferment. cap. 2.

the skin is drawn together like a *purse*, and the *pores* closed up, the hair comes constantly *white*: thus the subtle *Veterinarians* procure *white stars*, or other desired *marks* in the fore-heads of their *horses*; and I have seen the skins of *black* Grey-hounds powdered with *white*, or made *Ermynefs*, by applying *wood-ticks* to their skins when young, both which are performed also by *cicatrization*, and closing the *pores* of the skin, thereby hindering the exhalation of the *Sulphur* in those parts.

15. Which will further appear from an observation of my Lord *Verulam's* concerning *Flowers*, whereof the *whites* for the most part are more *inodorate* than other colours: And this he makes out in many *Flowers*, as single *white* Violets, the *white* Rose, *white* July-flowers, &c. We find also, says he, that blossoms of *Trees* that are *white* are commonly *inodorate*; as of *Cherry*, *Pear*, and *Plum-trees*: whereas those of *Apple*, *Crab*, *Almond*, and *Peach-trees*, are blusky, and smell sweet. The cause whereof is, that the texture of these *Plants* producing *white* Flowers (excepting such as produce *white* Flowers only, as *Lillies*; or are extravagantly succulent, as the *white* *Satyrion*) is so very close and fine, that it will not permit any *sulphureous* particles, which are also the cause of *smells*^r as well as *colours*, in any measure to ex-
bale. Which possibly may be found true, if duly examined, in all sorts of *Animals*; and if so, we hereby may be profitably instructed what *Beasts* of each kind are least offensive, and fittest for the conversation of *men* or *women*, especially *Ladies*, who commonly have great sagacity in smelling, may hereby be directed in the choice of their *Melitæi* or *Lap-dogs*.

16. As for *pyed* *Birds* that are generally of another colour, such as *pyed* *Pheasants*, &c. the case is easier, for such are produced either by common colour'd *Hens* troden by a *white* *Cock-pheasant*, or *vice versa*; which possibly may have happened also by our *white* *Linnet* whether male or female, or in any other *Birds* of any other *species*, as we see it falls out in *Dogs* and *Horses*, and most other *Animals*.

17. And this had been all concerning *Birds*, but that at *Witney*, Anno 1674. I met with an *Egg* about the bigness of a *Pidgeons*, containing another imperfect one in it, given me by Mr. *Hinton* the then Minister there, which seems to have been in the way toward such an *Ovum in Ovo* as is mentioned by the Learn-

^r *Idem in loco citato*

ed Dr. *Harvey*, and shewn by him to that incomparable Prince, *Charles the Martyr*, and many others; *Vidi inquit Ovum perexiguum* (*Fabricius Centeninum vocat, & Nostrates mulieres Gallo ascribunt*) *crustâ testum, intra aliud Gallinæ ovum majus, perfectum & cortice circumcirca obtectum, contineri*^s. Just such an Egg as this, pregnant with another, is preserved in the Repository of the *King of Denmark*, which was shewn by his Majesty to *Tho. Bartholine*, as he testifies in his *Epistles*^t; who also saw another in the year 1669^u. And *Geo. Sebastian Jungius* met with another of these the nineteenth of June, 1671^w. which are Authorities enough (though more might be brought) to justify my mentioning the thing, though by some thought inconsiderable.

18. Yet before we take leave of the inhabitants of the *Air*, we have something worth notice concerning winged *Insects*, and particularly of the feminine *monarchy* of *Bees*, not only the *Prognosticators*, but *Concomitants* of *Eloquence*: of their Prophetical presages of *future Eloquence*, we have instances in *Plato*, *Pindar*, *Lucan*, and that eloquent Father of the Church *St. Chrysostom*, about whose mouths, whil'st *Infants*, the *Bees* gathered, and dropt their *hony*, thereby fore-telling those *Rhetorical Endowments* they should hereafter be possess'd of, which accordingly came to pass.

19. But none of those, says the industrious *Butler*^x, are more memorable than the *Bees* of *Ludovicus Vives*, who being sent in the year 1520. by *Cardinal Wolsey* to *Oxford*, to be publick *Professor* of *Rhetorick* there, and placed in the *College* of *Bees* (*Corpus Christi* being so called by the *Founder* in his *Statutes*) was welcomed thither by a swarm of *Bees*, which to signify the incomparable sweetness of his *Eloquence*, settled themselves over his head under the leads of his *Study* (at the west-end of the *Cloyster*) where they continued about 130 years.

20. The truth of this story appears as well by the general voice of the House, who have received it by tradition, as by the special testimony of a worthy *Antiquary* [*Mr. Brian Twine*] who affirmed [to *Mr. Butler*] that he had often heard his master, *Dr. Benefield* (one of the publick *Professors* of *Divinity*) who then had *L. Vives's* chamber and study; and *Dr. Cole* (then *President*, and in *Q. Maries*

^s *De Generat. Animalium, Exercit. 10. de Ovi cortice.* ^t *Epist. Cent. 3. Ep. 42.* ^u *Epist. Cent. 4. Ep. 63.* ^w *Miscellanea Cur. Med. Phys. Acad. Nat. Curiosorum. An. 1. observ. 36.* ^x *Ibid. An. 2. observ. 250.*
^x History of Bees, Numb. 59.

days Scholar of this House) to say as much, calling these Bees, Vives his Bees.

21. In the year 1630. the leads over Vives his study being pluckt up, [it then being the study of Mr. Gabriel Bridges] their Stall was taken, and with it an incredible mass of bony: but the Bees, as presaging their intended and imminent destruction (whereas they were never known to have swarmed before) did that Spring (to preserve their famous kind) send down a fair swarm into the Presidents garden, which in the year 1633. yielded two swarms; one whereof pitched in the garden for the President; the other they sent up as a new Colony to preserve the memory of this mellifluous Doctor, as the University stiled him in a Letter to the Cardinal. Thus far Mr. Butler.

22, And there they continued, as I am informed by several ancient Members of that Society that knew them, till by the *Parliament Visitation*, in Anno 1648. for their Loyalty to the King, they were all, but two, turned out of their places, at what time with the rest of the inhabitants of the College, they removed themselves, but no further than the East end of the same Cloyster, where as if the feminine sympathized with the masculine Monarchy, they instantly declined, and came shortly to nothing. After the expiration of which ancient Race, there came, 'tis true, another Colony to the East corner of the Cloyster, where they continued till after the return of his most Sacred Majesty that now is: but it not being certain that they were any of the remains of the ancient Stock (though 'tis said they removed thence to the first place) nor any of them continuing long there, I have chose rather to fix their period in the year 1648. than to give too much credit to uncertainties.

23. And thus unhappily, after above six score years continuance, ended the famous stock of Vives his Bees, where 'tis pitty they had not remained, as *Virgil* calls them, an *Immortale Genus*^y. However, since they are now irrecoverably lost, it would not I think be amiss; if the College provided them another Colony; not that I think that Learned Society wants any such monitor of *Industry*, but that it seems but congruous, they should always have by them the Thing, whereof their whole House is but the metaphor, the Founder calling it *Alvearium*, and the Students,

Ingeniosas apes, dies noctesque Ceram ad Dei honorem, & dulcissima mella conficientes, ad suam & universorum Christianorum commoditatem. And this I the rather perswade, because by the new discovery of that excellent method of *Bee-houses* and *Colonies*, they are freed from most, if not all the hazards, charge, and trouble that heretofore attended *them*: Not to mention the advantage and profit accrewing by them, which has always been judged so considerable, that there have been several *Traacts* written and publish'd full of experiments, directions, and methods to be used in the menage of these *Insects*.

24. But none yet extant that I know of comparable to what are practised by *John Lad* of *Over-Worton*, and *William Tayler* of *Warkworth*, who though a *Northampton-shire* Man, has *Apifactories* in this *County*, who profess (as I am informed by the Reverend Mr. *Clark* Rector of *Dreyton* near *Banbury*) 1. That they can take *swarms* out of any *stock* that is able, and neglects to *swarm*, without any prejudice to the *stock*. 2. That they can take *hony* out of a *stock* without that hazard to the *Bees*, which (they say) the way proposed by the *Author* of the *Colonies* is subject too. 3. That they can secure any *stock* from the invasion of *Robbers*. 4. That they can so order an old *stock*, that the *Bees* shall gather pure *Virgin* honny. 5. If a *stock* be in low condition, they can preserve and recruit it, so as it shall do well. 6. They can take away a *Queen* where there is more than one in a *bive*, and place *her* in a *stock* where the *Queen* is dead, or otherwise wanting, and by that means keep the *subjects* together, which would else disperse. 7. If a *Queen* wants *subjects*, they can draw out of several *stocks* supplies in what number they please, that shall settle under *her* government. And these *operations* they commonly practice, which because profitable to *them*, they are unwilling should be made too common, which yet they are so ingenious as not to deny to communicate to fit *persons* upon reasonable *terms*.

25. Of other flying *Insects*, I have minded only the *Muscæ aquaticæ*, such as are generated in the waters, and come of *Caddis-worms*, and therefore called by *Johnston*, *Phryganides*², quod è *Phryganie Monfeti*³ (the *Caddis* of the *English*) ortum habeant:

² *Hist. Nat. de Insectis, lib. 1. tit. 2. cap. 2. art. 2. punct. 4.* ³ *Insect. sive Min. An. Theat. cap. 12. de Muscarum usu.*

Nor shall I venture to describe above *one* of these neither (and that only as a *specimen* of what I intend of the *rest*, as fast as I can compass the *method* of their productions) which I think I may call *Musca è Phryganio saxatili*, there being a *stone*, as well as a *stick Caddis*, or *Cad-worm*; in the generation of which, *Nature* seems to observe the following *method*. First, there appears on the *stone* to which many of them stick, as in *Tab. 10. Fig. 4.* only little *bubbles* of a glutinous nature, like the *spawn* of *frogs*, which by the descent of *gravel* and *sand* that stick to them, are formed into *stone Caddis* houses, including the *Animal* therefore called the *stone Caddis*; which after it has continued in its *rough-cast stone* house its due time, gets off the *stone* either to the bank of the *River*, or climbs up some *reed*, where also leaving its *house*, it becomes a *flye*, somewhat like in shape to the *Musca domestica*, or *bipiles Moufeti*^b, that come of the *stick Caddis*, only it is shorter, and wants both the *Antennæ* and forked bristly tail; but most of all like the *Breise*, only the *Breise* is all gray, and this has a *black* head and *dark brown* wings. See its form, *Tab. 10. Fig. 5.*

26. Other *water Flys* there are that come of such *worms*, called *Cock-spurs*, *Rough-coats*, *Pipers*, &c. of which no more at present till further observation; but that though at last they come to be *flying Insects*, yet at first they are all of them *water Animals*, which puts me in mind of proceeding next,

27. To the *Fishes*, whereof we have a sort in the *River Isis*, that we call here a *Pride*, of the long cartilaginous smooth kind, concerning which *Authors* seem so obscure, that I know not whether it be described at all; or if it be, it is done so imperfectly, that perhaps it may be acceptable if I contrive another. The *Fish* the most like it of any I can find, is the *Lampetra parva fluviatilis* of *Rondeletius*^c, rendred by *Dr. Charlton*^d and *Dr. Merret*^e, the *Stone-grig*: it having a mouth cut neither perpendicularly downward, nor transversely, but hollowed as it were between two cheeks, without an under jaw, after the manner of *Leeches*; on the top of its head it has *one*, and on each side *seven* holes that supply the place of *gills*; and under the belly a small *line*, reaching from the mouth to the *exit* of its excrement; it moves

Plate
p. 212

^b *Idem. cap. 11.* ^c *De Piscibus fluviatilib. cap. 24.* ^d *Onomast. Zoicon. tit. Pisces, cap. Lævium.* ^e *Pinax rer. Nat. Britan. p. 188.*

by a *winding impulse* of its body, without the help of any other fins but the *pinnulæ* at the tail, by which it steers its course; and thus far it agrees with the *Lampetra fluviatilis*.

28, But though they agree in some particulars, they differ in as many, our *Pride* being *streaked* from the top of its back down to the afore-mentioned *line* at the bottom of its belly, with lines of a distinct colour from the rest of its body, like the *Prickamarina* of *Aldrovandus*^f, whereof the *Lampetra* is not said to have any: Beside the two *pinnulæ* of the *Lampetra*, whereof one stands on the top of its *tail*, and the other a little higher on the *back*, some space interceding; the *Pride* has another underneath its tail, joyning with the other from above at the tip, making the whole tail to end like the *head* of a *spear*. Moreover, the eyes of the *Pride* are very obscure, and not such plain round ones as are given the *Lampetra*, not only in the description but Cut of *Rondeletius*; And though it have a *hole* in its *head*, yet it stands not as *Rondeletius* describes it in the *Lampetra*, just in the middle between the *eyes*, but more forward in the extremity of the *head*, near the upper lip; all which may plainly be seen *Tab. 10. Fig. 6, and 7*. Whence 'tis easie to conclude, that either this *Fish* has not been described at all, or so very meanly, that there was almost a necessity of giving another, either of which I suppose will excuse this attempt.

29. Beside the *Pride* which we think undescribed, we have another sort of *Fish* plentiful in the *Cherwell* (scarce ever found in *Isis* but below the place where the *Rivers* joyn) that is more certainly so; and that a *Fish* of the *squammos* kind, which they call a *Fin scale*, somewhat like a *Roach*, only the *belly fins*, and the single one at the *exit* of the excrement, and *those* at the tail are much *redder* then those of a *Roach*; it has also a full *black eye*, incompassed with a *yellow iris*, whereas that of a *Roch* is *red*; it is also a much deeper and thinner *Fish*, but yet neither so deep or thin as a *Bream*; from which also it differs not only in the *redness* of its *fins*, but in that the *single fin* placed next the *exit* of its excrement, is not continued to the tail as it is in the *Bream*: Its *fins* at the *gills* are much *whiter* than the rest, and that upon the back of a *dirty bluish* colour: its *scales*, especially near the back, are of a *greenish yellow* colour, on which from the *gills* to the tail

Plate X.
p. 212.

^f *Aldrovand. de Piscibus, lib. 4. cap. 13.*

there runs a crooked line of *points*, one on each *scale*, as in *Tab. 10. Fig. 8.* The *Fishes* most like it of any described, are the *Bol-lerus* or *Bordeliere*, and the *Phoxini*, *Rose* or *Rosiere* of *Rondeletius*^g; but that they cannot be the same is plain from hence, in that the *Bordeliere* is confest to have no *teeth*, whereas the *Finscale* has *teeth* as large as a *Roach*; and the *Phoxini* never to be found without *spawn*, or to exceed *half a foot* in length, whereas I have seen *Finscales*, even in time of year when one might well have expected it, without any *spawn*; and some of them (particularly the described one, *Fig. 8.*) from the *mouth* to the *fork* of the tail a *foot long*, and four inches and a half in depth, beside many other *differences* that might also be brought.

30. Which is all I have met with *extraordinary* amongst the *squamous* kind of *Fish*, but that there is a sort of *Chub* peculiar to the *Evenlode*, some say exceeding, all equalling the *Pearch* or *Tench* in goodness. And that at *Lillingston-Lovell*, about six years since were taken two *Salmons*, one somewhat above, the other somewhat under a *yard* in length, in a small *brook* (a branch of the *Ouse*) that a man may step over, little less (as the *river* runs) than two hundred miles from the *Sea*. How these *Salmons* should come up so *high*, has been much wondered at by *some*, since so many *Mills* and *Locks* stand in the way on this *Rivulet* to hinder them: but to such as have either seen, or but read of the *Salmon-leap* at *Kilgarran* in *Pembroke-shire*^h, or at *Wasserfal* in the *Rhine*, which I suppose is much greater, and that they run up that *river* above five hundred miles to the *Lake of Zug* in *Switzerland*ⁱ, perhaps it may not appear so strange; especially if it be also considered, that our *Mills* and *Locks* have most of them *back streams* and *lashers* to carry off the water when it is too plentiful, over which the *leap* is but very inconsiderable.

31. I have met with also somewhat remarkable of our *fresh water shell-fish*; and particularly of a sort of *Gammarus*, or *Crey-fish*, found in *Salford* stream, that do's not boil to a *brisk red* colour, but at best of a *dirty yellowish red*, which I suppose must be attributed to the badness of the water, infected with ill qualities perhaps by the *Moor* through which it passes, which is very agreeable to one, of *Cardans* signs of good water: *Ubi aqua bona* (says he)

^g *Rond. de Piscibus lacustribus, cap. 8. & de fluviatilibus, cap. 28.* ^h *Camden in Pembr. & Cardigan.*
ⁱ *Mr. Rays Observat. Topograph. &c. p. 430.*

astaci debent esse valde rubri, cum coquantur^k: whence 'tis easie to conclude (if the *Symbol* be truly put) that where they boyl of a different colour, the water must needs be *naught*.

32. I found also in Ponds at *Bradwell*, *Hanwell*, and *Shot-over Forest*, as well as in *Rivers*, the *Mytilus fluminum maximus subviridis*, whereof I examined several in hopes of the *Pearls* to be found in them, mention'd by Sir *Hugh Plat* in the *Appendix* to his *Jewel-house of Art and Nature*¹; but I could not meet with any with *craggy rough* out sides, in which it seems they are only found (ours being all of them *smooth*) and so lost my labor; but I hear they are to be met with in *Buckingham-shire*, *Montgomery-shire*, and *Shrop-shire*, as Sir *Hugh* also informs us, where more fully concerning them, if this *design* be encouraged, and I live to *travel* and *examine* the productions of these *Counties*.

33. We have also in great plenty all the *Cochleæ fluviatiles*, or fresh-water Snails mention'd by Mr. *Lister*^m, concerning which I can add nothing, but that his *Cochleæ fasciatæ ore ad amussim rotundo* (which is somewhat strange) seem to be all *viviparous*, containing their young within their bodies, cover'd over with *shell* before their exclusion, as I found it upon examination in great numbers of *them*; and that I found most of them this *Summer* swimming above water, dead and stinking, which whether to be ascribed to the *drought*, or any other *cause*, I am yet uncertain.

34. Amongst the *Cochleæ marinæ*, and *fluviatiles*, I find all the *Naturalists* to treat of the *Cochleæ terrestres*ⁿ, though I think they should rather be put under the title of *Reptils*; whereof we have one *sort* met with in *Cornbury Park* by Mr. *Jacob Bobart junior*, that I find not described in any of our *Zoographers*: in shape (though not so big) like the *Turben magnus* of *Rondelet*^o, or the twelfth *Turbo* of *Aldrovandus*^p, having a long *Turbinated shell* rough and unequal, by reason of many protuberant ribs thwarting the *helical* turns of the *shell*, as in *Tab. 10. Fig. 9.* which was found alive and creeping on the grass, but what it should be I cannot divine, unless the same with the *Cagaroles* of *Spain* and *Montpellier*, mentioned by *Aldrovandus*^q, which he seems to describe to be a

^k In *Hippoc. de Arte Aquis & Locis*, lib. 2. Lect. 14. in text. 2. 3. ¹ Sir *Hugh Plats App.* p. 221. ^m *Philosoph. Transact. Numb. 105.* ⁿ *Vid. Gesnerum de Cochlearum terrest. divers. speciebus. lib. 4. de Aquatilib. & Aldrovandum. lib. 3. de Testaceis, cap. 30.* ^o *Rond. de Testaceis, cap. 16.* ^p *Lib. 3. de Testaceis, cap. 30.* ^q *Idem de Testaceis, cap. 31.*

Cochlea terrestris of this figure, but gives no cut of it.

35. Of other *Reptils* we have little to say, but that in the *Lordship* of *Blechington*, and all the more *Northern* parts of *Oxford-shire*, no *Snakes* have been ever or very rarely seen, in so much that I met with several ancient people about *Deddington* and *Banbury* that scarce ever saw a *Snake* in their lives, at least not in that *Country*. And at *Blechington* 'twas confidently believed, that a *Snake* brought from any other place, and put down there, would instantly die; till I made the *experiment* and found no such matter: Whereupon I got leave (in the absence of the *Family*) to inclose my *Snake* in the *Court*, before the Right Honorable the Lord *Anglesey's* house, to see what time would produce, leaving the *Gardiner* in trust to observe it strictly, who found it indeed, after three weeks time *dead*, without any sensible external hurt.

36. How this should come to pass, is a *question* indeed not easie to determin, but certainly it must not be ascribed to the *Talismanical* figure of the stone *Ophiomorphites* to be found about *Adderbury*, and in most *blue clays*, whereof there are plenty in this *Country*. Since these are to be met with about *Oxford* too, and many other places, where there are *Snakes* enough. Beside, we are informed by *Cardan*, that *Albertus Magnus* had a stone, that being naturally mark'd with the figure of a *Serpent*, had this no less admirable than contrary *virtue*, that if it were put into a place that was haunted with *Serpents*, it would draw them all to it: Much rather may we subscribe to the cause assigned by *Pliny*, who seems confidently to assert, that the earth that is *brackish*, and standeth much upon *Salt-peter*, is freer from *vermin* than any other. To which we may add (if need be) *Sulphur* and *Vitriol*, whereof there is plenty in these parts of the *County*; but whether by *one*, *two*, or *all* these, though we dare not pronounce, yet that it is caused by some such *mineral steam* disagreeable to the *Animal*, I think we may be confident.

37. Amongst the *inhabitants* of the *Earth*, come we next to the *Quadrupeda*, whereof some are *μωνάριχα*, whole-hooft, such as *Asses*, *Mules*, *Horses*, of which last kind I met with three remarkable for their age; one at *Souldern*, another at *Sherbourn*, and a third at *Aston Rowant*, each reported to be about forty years old

apiece. And amongst the *Quadrupeda διχyla*, or cloven-hoofed Beasts, there was a *Hog* at *Upper-Tadmerton*, of as strange a *stature* as they were of *age*; being fed by one *Pargiter* to so extravagant a greatness, that he came at last to be near 13 hands high, as it was testified to me by the Reverend Mr. *Whateley*, Rector of the place, and several others who had carefully measured him.

38. Of *four footed Beasts* that chew the *cud*, they have a sort of *sheep* esteemed in this *Country* for their constantly bearing *two lambs* at a time, whence they have justly obtained the name, though somewhat an improper one, of *double Ews*. They are said to have been first brought into this *Country* by the Worshipful *James Uxley* of *Darnford Esq*; where I hear they are still preserved by the Right Worshipful Sir *Nicholas Pelham* Knight, who with one of his *daughters* (a *cobeireß*) enjoys that *Estate*. I heard of them also about *Newington* and *Dorchester*, and some other places here and there in the *County*.

39. But there are much stranger *sheep*, though perhaps not so profitable, at *Ricot* in the Park of the Right Honorable the *Lord Norreys*, brought hither from some other parts of *England* or *Wales*, but now breeding *here*: Of which, some of them at first had six or eight horns apiece, but the number upon mixture of their generation with other *sheep* is since diminish'd. However, there remain still *two* of them with very *strange heads*, having each *four horns*; one of them with two larger *ones* issuing from the top of its head, bending forward, and two side *ones* coming out from under its ears, and bending round towards its mouth, as in *Tab. 10. Fig. 10*. And the other having two large *horns* standing pretty upright on its head, and two side *ones* proceeding from under the ears like the former, and bending round to the cheeks, into which they would grow (and so in the whole *kind*) were they not prevented by being timely cut off, as in *Tab. 10. Fig. 11*.

40. And as these are remarkable for their many *horns*, there was another *sheep* once there, that excelled all the rest, in its being a *Unicorn*, having a single horn growing almost in the middle of its fore-head, 21 inches long, with annulary *protuberances* round it, and a little twisted about the middle, as in *Tab. 10. Fig. 12*. There was, 'tis true, another little *horn* grew on the
same

same head, but so inconsiderable, that it was hid under the wool. This head is still preserved by the Honorable the Lord Norreys, and is now to be seen nailed up at Ricot on the North side of the Hall.

41. To which may be added a Cow of Mrs. Dunches, of Newington near Dorchester, more strangely prolific, than the Sheep are strange in form, that whilst a Calf, before she was eleven months old produced another: which Animals carrying their burthen no less than nine months, we must either admit that she took Bull at about ten or eleven weeks old, or that the Cow her self was at first brought forth pregnant of another, as Aristotle reports a sort of Mice commonly are in a certain place in Persia, ἡ δὲ Περιοικὴς ἐν πρὶ τόπῳ ἀναχζωμένων ἐμβρύων, τὰ θήλια ὅς κύντα φαίνεταί, i. e. that in female Mice dissected, the female off-spring was found pregnant with others^r. The same again is reported by Claudius Ælian of the very same Animals, near the Caspian Sea^u. And Aristotle further acquaints us, that the Fish Phoxini have spawn when they are very little, μικροὶ ὄντες φοξίνοι κλήματα ἔχουσι are his very words^w, in so much that Rondelet adds, ut periti Piscatores cum ovis nasci affirmant^x.

42. We are informed also, that the same sometimes happens in more perfect Animals, by Joan. Baptista Nierembergius, who tells us of a certain mare in Spain that brought forth a mule, great of another^y. And the learned and observing Bartholin^z, yet further acquaints us, that in the Parish of Uleslovia near Neoburg in Fionia, Joan the wife of Nicholas Peter, a Husbandman of that Country, was deliver'd of a female still-born child, pregnant with another female, duly placed in the womb about a span in length, with all its parts so perfect, that the Grand-mother (who dissected the pregnant infant) believed it had been living.

43. But what yet comes nearer to the business, we are informed by David Spilingerus, Physitian of Leutschovia, that in the year 1663. there was a Cow in Hungary that brought forth a Calf with a great belly, wherein there was found another Calf with all its limbs perfect^a. How these things should come to pass, the learned Bartholin gives us his conjecture, viz. that in such productions as these three last, Nature at first intended only twins,

^r Hist. Animal. lib. 6. cap. ult. ^u Δελ. Ζών. lib. 17. cap. 17. ^w Hist. Anim. lib. 6. cap. 13. ^x Rond. de Piscib. fluviatil. cap. 28. ^y In Hist. Nat. lib. 6. cap. 2. ^z Hist. Anatom. & Med. rar. Cent. 6. Hist. ult. & Epist. Med. Cent. 3. Ep. 23. ^a Miscellan. Curiosa Med. Phys. Germania, An. 1. observ. 36.

and that by some error in her procedure, *one*, of each of *these*, might be thrust into the belly of the *other* (as I suppose it happened in some measure in the case of *Lazarus Colloredo* and his Brother *Baptist*^b) over which we may easily allow a skin to be superinduced. But that ever any such second *fetus* was brought into the world, living after the first, we have no *instance*, except this *calf* of *Newington* may pass for *one*, which is wholly left to the *readers* judgment. For my part, I am rather inclined to believe that the *Cow* might take *Bull* at ten or eleven weeks old, that being the lesser wonder of the two, especially having lately received news out of the *Country* from an intelligent *Lady*, that the thing is not so strange, but possible enough.

44. Hither also must be refer'd the three *calves* brought forth by a *cow* at one time, that I met with at *Hardwick* not far from *Bisseter*, which though a production not frequent, yet is as much remarkable in that they became all grown *cattle*, and so strangely *alike*, that their very *owner* himself scarce knew them asunder, much less could I, though I observed them strictly: whence I was firmly convinced, that *similitude* was a concomitant as well of *Tergemini* as *Twins*, and held as well in *Brutes* as *rational Animals*.

45. Nor can I pass by without admiration, the *Deer* of *Cornbury Park*, which before His *Majesties* wonderful restoration, being (in part at least) turned into a *Cony-warren*, the *Deer* upon it had all *dwarf heads*, the most of them irregular, as in *Tab. 10. Fig. 13.* but if any of them were uniform, as in *Tab. 10. Fig. 14.* yet they were still far short of growth, seldom exceeding 8 or 10 inches long, though the *Deer* themselves were well enough grown, and warrantable; the two that bore those *engraven heads*, being both of them two years a *Buck* at least, and in all other respects well enough liking: which yet as soon as the *Warren* was destroyed by the present *Proprietor*, the Right Honorable the *Earl* of *Clarendon* came again, to have as *fair branched-heads* as any *Deer* whatever in the adjoining *Forrest*: Which *strange alterations* I cannot guess to proceed from any other *cause* than the infection of the grass by the *urin* and *crotizing* of the *Conies*, which being hot and dry must needs abate the moisture of the *Deer*, which supplied matter for the *fair heads* wherewith before and since

^b *Iho. Barthol. Anatom. Med. rar. Hist. 66.*

they have been as well adorned, as any of their *kind*.

46. Amongst the *Quadrupeda* πολυδάκτυλα, or *claw-footed Animals*, I met with nothing so strange as the *rib* of a *Dog*, or some such like *Beast*, set in a *bone* interceding two other *ribs*, that the *intercostal parts* were filled with it, as in *Tab. 10. Fig. 15.* in so much that if all the *ribs* were thus qualified, the whole *chest* of that *Animal* must needs be *one bone*. This was found about *Oxford*, and given me by the Right Reverend Father in God, *Thomas Lord Bishop of Lincoln*. And there are *two* other *ribs* joyned in like manner, to be seen in the *Repository* in the *Medicin School*. But I find this has happened not only to *Beasts*, but sometimes to *Men*, who have been always remarkable for their *prodigious strength*; whereof in their respective places as I meet them hereafter.

C H A P. . VIII.

Of Men and Women.

THE subject matter of this *Chapter* being very narrow, extending it self only to *Man*, whom God created *Male* and *Female*, and them only in his own *Image*, little lower than the *Angels*: It cannot be expected, that the *methods* of the other *Chapters* can be observed here, there being no new *species* of *Men* to be produced, or not sufficiently noted already. All therefore that remains concerning them to be handled here, will be only the unusual *Accidents* that have attended them, whereof, though I have not met with over *many* in this *County*, yet they are enough to be distributed into such as have attended them,

either { *at or before their birth.*
 { *in their course of life.*
 { *in their death or grave.*

2. Before the *birth* of *Man*, the *Vagitus uterinus*, or crying of the child in the *mothers* womb, is not ordinarily to be met with, though we find many examples of the thing in *Authors*^c, to which may be added one more that lately happened at *Heyford Purcel*, where there was a child cryed very audibly in its *mothers* womb somtime before the *birth*. For the performance of which action, whether there be a necessity of the *Infants* having respiration whil'st included in the *Amnion*; or whether it may not be done without it? let the *Physitians* dispute: The matter of fact sufficeth me at present that there was such a thing, the people being frightened with it, and expecting some calamity should soon attend such a *Prodigie*, pernicious (forsooth) not only to the *place* where heard, but to the *State* it self. Whereas the learned *Bartholin* more rightly notes, that the ruin of *Kingdoms* depends rather on the wickedness of the people, living in contempt of *God* and his *Laws*, than any such *vagitus*; which portends nothing but happiness to the *Infant*, the *Mother*, and *State*

^c Tho. Bartholin. *Hist. Anatom. rar. Cent.* 1. *Hist.* 1.

it self: To the *Infant*, in that it is an *Index* of its strength, and perfection of *Organs*; To the *Mother*, in the certainty that her child is living, and likely to promote its own *exit*; To the *State*, which is likely to be blest with an *able subject*: the *Vagitus* being nothing but such an *Jo Triumphe*, as *Livy*^d reports was made by the *infant* in the *mothers* womb in *Marrucinis*, *Q. Fabius Maximus* being the fourth time, and *M. Marcellus* the third time *COSS.* So that if any thing amiss fall out after such *Vagitus*, it must be imputed rather to chance than design of *nature*: Let us but mend our *lives*, and no such matters can hurt us.

3. In the *birth* of *man* it is equally strange, that the *pangs* of the *woman* in the exclusion of the child have sometimes affected the *Abdomen* of the *husband*, which yet to such as have experimented the secrecy of *sympathies*, and understand the subtilty and power of *effluvioms*, perhaps may not seem difficult: But that the *man* should sometimes suffer such *pains*, whil'st the *woman* is well, and before she is in *labor*, is a *problem* I fear beyond all hopes of *solution*. And yet that this has happen'd to some *persons* in *Oxford* is very certain, and that to knowing *ones* too, very unlikely to be deceived, and of unquestionable veracity: whereof *one* of them told me (*whom* I enquired of more particularly concerning *them*) that they came upon *him* when he little thought of his *wife*, and that the *pangs* were very odd *ones*, such as he never felt in his life; not like any *gripping* in the *guts*, but lying in the *muscles* of the *Abdomen*, which yet he should never have thought to have had relation to his *wife*, had they not suddenly, and beyond expectation ceased, as soon as his *wife* began to be in *labor*. Which makes much for the credit of a relation of the *German Virtuosi*^e, concerning one *Faber* of *Buxovil* in *Alsatia*, who constantly acted the part of his *pregnant wife*, being taken with *vomitings*, and suffering those inordinate *longings* that usually attend *women* in that condition, his *wife* all the while suffering no such *inconveniencies*.

4. That such *symptoms* should be thus translated from the *woman* to the *man*, the *woman* remaining well and undisturbed, *Dr. Primirose*^f thought so irrational (upon account that *natural Agents* first work on the *nearest* objects, and then on the *remote*st, and

^d T. Livii *Hist. ab Urbe Cond. lib. 24.* ^e *Miscellanea Curiosa Med. Phys. German. An. 2. observ. 215.*

^f Jac. Primirofii *M. D. de vulgi erroribus, in Med. lib. 2. cap. 13.*

that therefore a *woman* must needs be first affected with her own *noxious* humors) that *he* lookt upon it as no better than a ridiculous error, as indeed I think I should have done my self, but that I am otherwise perswaded by *sober men*, who well know how to distinguish the manner of the *pangs*, and the circumstances of them: Nor should I have ventured to have made this relation, but that the *persons* are living, and ready to justifie what I have written to any *person* fit to be discours'd with about such *matters*: but how they should come to pass, is so hard to determin, that I dare not yet attempt it, it being difficult not to err concerning such *mysteries* of *Nature*.

5. That *women* may bring forth *three* at a birth appears evidently by the example of the *Horatii*, and *Curiatii*; to whom may be added, though of unequal rank, the three children of a *Tayler* here in *Oxford*, which he had all at a birth. But to go above that number says *Pliny*^s, is reputed and commonly spoken off as *monstrous*, and to portend some mis-hap: for confirmation whereof, he instances in a *Commoners* wife of *Ostia*, who was delivered at one birth of *two boys* and *two girls*; but this, says he, was a most prodigious token, and portended no doubt the *famine* that ensued soon after: *i. e.* It pleased *God* to visit those parts with *famin* about that time, there being no more dependence between the *famin* and the *preceding birth*, than there is between the *Wars*, *Plagues*, and *Famins*, that sometimes follow *Comets*; there having been (no question) as many of *them*, to which nothing extraordinary has been subsequent, as to which there has; and so of *Births*.

6. Witness the *four children* brought all at a time by *Elenor* the wife of *Henry Deven* of *Watlington*, *An.* 1675. since which time we have yet lived (thanks be to *God*) in as great *health*, *peace* and *plenty*, under our good and gracious *King*, as ever *People* did, which *God* of his mercy continue to us; *whom* if we serve in sincerity, performing unto *Him* an honest, faithful, and uniform obedience (though 'tis true our best performances will be mixed with much of weakness, ignorance, frailties, and recidivations) we need never to fear the *influence* of any such *accidents*, though they much exceed the ordinary course of *nature*.

7. The same *Pliny*^h informs us, that many *men* indeed have

^s Nat. Hist. lib. 7. cap. 3. ^h Nat. Hist. lib. 7. cap. 14.

begotten *children* at sixty or eighty years old : for which he instances in *Volusus Saturninus*, who on Dame *Cornelia*, of the lineage of the *Scipio*'s, begat *Volusus Saturninus* (who afterward was *Consul*) at sixty two years old and upwards. *Cato Censorius*, says the same *Pliny* (ancestor to *Cato* who slew himself at *Utica*) begat a son on the daughter of *Salonius* his Vassal, after he was past 80 years of age ; and King *Massinissa*, another, whom he called *Methymathnus*, when he was eighty six. But as to *women*, he is positive that they are past *child-bearing* at fifty, and that for the most part their *customary purgations* stop at forty.

8. But I met with an instance at *Shetford* near *Banbury*, that proves him plainly mistaken, where I saw and spoke with one *Catharine Tayler*, that had a son then living and lusty, in the sixtieth year of her age, which was testified also to me by many there about. And I have since heard of one Goodwife *Harvey* of *Smithengreen*, in the Parish of *Leigh*, within three miles of *Worcester*, that is now with child in her *sixty third* year, which are instances wonderful rare, and scarce heard of in other *Countrys* ; though we are informed indeed by Dr. *Boat*ⁱ, that amongst the women in *Ireland*, there are several found who do not only retain their *Catamenia*, but even their fruitfulness, above the age of *fifty*, and some till that of *sixty* years ; whereof he tells us, his brother knew some, who being above *threescore* years old, did not only conceive and bring forth children, but nursed them, and brought them up with their own milk : which also as we are acquainted by *Gul. Pifo*^{*}, is very common in *Brasil*.

9. As in the *child-bearing* of *women*, and the *accidents* attending it, I have met with also somewhat extraordinary in their *growth*, which must be ranked among the *accidents* that have befallen the sex during their *course of life* ; and such is the growth of one *Philippa French*, born at *Milcomb* in this *County*, now six or seven and thirty years of age, and a married woman, having all her parts proportionable, and of good *symmetry*, yet wanting half an *inch* of a *yard* in *height* : which is somewhat lower than *Manius Maximus*, or *M. Tullius*, who as *Varro* reports, were each but *two cubits* high, and yet they were *Gentlemen* and *Knights* of *Rome* : but higher then *Conopas* the Dwarf of *Julia*, Niece to *Augustus*,

ⁱ Natural History of Ireland, chap. 23. sect. 1. * Gul. Pifo, de *Indiæ utriusque re Nat. & Med. lib. 1. cap. 1 p. 13*

who as *Pliny*^k tells us, was but *two foot* high and a *hand bredth*; but he tells us not whether *Conopas* were at his full growth, or had good *symmetry* of parts like our *Philippa*, it being common enough for persons to be very low of stature, when either their Bodies are awry, or some of their parts disproportionable to the rest.

10. And amongst such *accidents* as these, we may reckon a strange *disease* that befel *Mary* the daughter of *John Collier* of *Burford*, who out of the corners of her eyes excluded a sort of *congealed* matter, which after some time turned into a *stony* kind of *substance*, not unlike the *stones*, as they were described to me, that somtimes come forth of the tumor called *Atheroma*: which I therefore guess to have been only a more exalted kind of *Ægilops*, or *fistula lachrymalis*, and not to have been caused by *fascination*, as *Lachmund*^l thinks the *stones* were that came forth of the left eye of *Margaret* the daughter of *Conrad Brandis* of *Banteln*, she being cured of the *disease* by that eminent *Oculist* *Dr. Turbervil* of *Sarum*.

11. Yet a much stranger *accident* than that befel one *Rebeckah Smith*, the Servant-maid of one *Thomas White* of *Minster Lovel*, who being of a robust constitution, though she seldom eat flesh (it scarce agreeing with her) and above 50 years of age; after she came from the *Communion* on *Palm-sunday*, *April 16. Anno 1671.* was taken with such a dryness in her throat, that she could not swallow her *spittle*, nor any thing else to supply the decays of *nature*: and in this case she continued without eating or drinking, to the amazement of all, for about *ten weeks*, viz. to the 29 of *June*, being both *St. Peters*, and *Witney-fair* day: by which time being brought very low, her *master* enquired and found out a *person* who gave him an *Amulet* (for it was supposed she was bewitch'd) against this *evil*; after the application whereof, within two or three days time (though I dare not suppose there was any dependence between the *medicin* and *disease*) she first drank a little *water*, then warm *broaths* in small quantities at a time, and nothing else till *Palm-sunday* again *twelve months* after, when she began to eat bread and other food again as formerly she had done, and is now about the age of *sixty*, and still *living* at the same place ready to testify the truth of the thing, as well as *Tho. White* and

^k *Nat. Hist. lib. 7. cap. 16.* ^l *Fred. Lachmundi, 'Oculorum &c. sect. 3. cap. 22.*

his *wife*, who were all that lived in the house with her, and will confidently assert (for they carefully observed) that they do not believe she ever took any thing in those *ten weeks* time, nor any thing more all the *year* following but what was above-mentioned: wherein I think they may the rather be credited, because there was never any *advantage* made of this *wonder*, which argues it clear of all *juggle* or *design*.

12. Concerning the death of *women*, we have two as remarkable *examples*, as any perhaps to be met with in *History*, both of them being confirmations of what *Pliny* says of them, that they much more frequently *revive* after they have been reputed dead, than *males* do *, whence doubtless also the *Proverb*, *mulieri ne credas, ne mortuæ quidem*. Of which recoveries of the *female* Sex rather than the *male*, the same *Pliny* offers us a *natural* reason, but I think fit to wave it, especially since the *reviviscence* of *Anne Green*, innocently condemned to dye, and executed at *Oxford* for the murder of an *abortive* Infant, is rather ascribed to the *Justice* of *Heaven*, than to the strength or other conveniencies of *nature* for such purpose in *women* rather than *men*, though it must also be allowed, that *God* Himself makes use many times of *natural* means in production of the most wonderful, most amazing *effects*. The *History* whereof, as it is taken out of a *Chronicle* of the late *Civil Wars*, by *James Heath* Gentleman ^m, and the continuation of the *History* of the *World*, by *Dionysius Petavius* ⁿ, with some few additions and alterations, take as followeth.

13. In the year 1650. this *Anne Green*, being a *Servant-maid* of the Right Worshipful Sir *Thomas Read* of *Duns Tew* in *Oxfordshire*, was gotten with child by some *servant*, or other of the family (as *she* constantly affirmed when *she* had little reason to lye) and through over-working *her self* in turning of *mault*, fell in travel about the *fourth* month of her *time*: But being but a young wench, and not knowing what the matter might be, repairs to the house of *easment*, where after some straining, the *child* (scarce above a span long, of what sex not to be distinguish'd) fell from *her* unawares. Now presently after, there appearing signs of some such matter in the *linnen* where she lay, and *she* before having confest, that she had been guilty of what might occasion

* *Hist. Nat. lib. 7. cap. 52.* ^m *History of the Civil Wars of England, Scotland, and Ireland, in Anno 1650.* ⁿ *Append. ad Hist. D. Petavii, in Anno 1650.*

her being with child, a search instantly was made, and the Infant found on the top of the *ordure*.

14. Whereupon, within three days after *her* delivery, *she* was conveyed to the *Castle* at *Oxford*, where forthwith (an *Affise* being purchased on purpose) *she* was arraigned before Serjeant *Umpton Croke*, then living but at *Marston*, who sat as *Judge* by a Commission of *Oyer* and *Terminer*, and by *him* sentenced to be hanged; which was accordingly executed on the fourteenth of *December* in the said *Castle-yard*, where *she* hung about half an hour, being pulled by the legs, and struck on the brest (as *she* her self desired) by divers of her *friends*; and after all, had several stroaks given her on the stomach with the but-end of a Soldiers *Musket*. Being cut down, *she* was put into a *coffin*, and brought away to a house to be *dissected*, where when they opened it, notwithstanding the *rope* still remained *unloosed*, and *straight* about her neck, they perceived her *brest* to rise; whereupon one *Mason* a *Taylor*, intending only an act of charity, set his foot upon her brest and belly; and as some say, one *Orum* a Soldier struck her again with the but-end of his *musket*.

15. Notwithstanding all which, when the learned and ingenious, Sir *William Petty*, then *Anatomy Professor* of the *University*, Dr. *Willis*, and Dr. *Clark* now President of *Magdalen College*, and *Vice-Chancellor* of the *University*, came to prepare the *body* for *disssection*, they perceived some small ratling in her throat; hereupon desisting from their former purpose, they presently used means for her recovery, by opening a *vein*, laying her in a *warm bed*, and causing another to go into bed to *her*; also using divers *remedies* respecting her *senselessneß*, *Head*, *Throat*, and *Brest*, in so much that within 14 hours, *she* began to speak, and the next day talked and prayed very heartily.

16. During the time of this her recovering, the *officers* concerned in her *execution*, would needs have had her away again to have compleated it on her: but by the mediation of the *worthy Doctors*, and some other *Friends*, with the then *Governor* of the *City*, Colonel *Kelsey*, there was a guard set upon *her* to hinder all further disturbance, till he had sued out her *pardon* from the *Powers* then in being; thousands of people in the mean time coming to see *her*, and magnifying the just Providence of *God* in thus asserting her innocency of *murther*.

17. After

17. After some time Dr. Petty hearing *she* had discoursed with those about *her*, and suspecting that the *women* might suggest unto *her* to relate something of strange *visions* and *apparitions* she had seen, during the time she seemed to be *dead* (which *they* already had begun to do, telling about that *she* said, *she* had been in a fine *green-meddow*, having a *River* running round it, and that all things there glittered like *silver* and *gold*) he caused all to depart the *room* but the *Gentlemen* of the *Faculty*, who were to have been at the *dissection*, and asked her concerning her *sense* and *apprehensions* during the time she was hanged.

18. To which she answered at first somewhat *impertinently*, talking as if *she* had been then to *suffer*. And when they spake unto her concerning her *miraculous deliverance*, *she* answered, that *she* hoped *God* would give her *patience*, and the like: Afterward, when *she* was better recovered, *she* affirmed, that *she* neither remembered how the *fetters* were knocked off, how *she* went out of the *Prison*; when *she* was turned off the *ladder*, whether any *Psalm* was sung or not, nor was *she* sensible of any *pains* that *she* could remember: what is most observable is, that she came to *her self* as if *she* had awakened out of a *sleep*, not recovering the use of her *speech* by slow degrees, but in a manner all together, beginning to speak just where she left off on the *gallows*.

19. Being thus at length perfectly recovered, after *thanks* given to *God*, and the *persons* instrumental in it, *she* retired into the *Country* to her *friends* at *Steeple-Barton*, where she was afterwards *married*, and lived in good repute amongst her *Neighbors*, having *three* Children afterwards, and not dying as I am informed till the year 1659. Which *occurrence* being thought worthy of remembrance by the *Author* of the continuation of the *History* of the *World*, by *Dionysius Petavius*, who esteemed it no less than the finger of *God* pointing out the *Maids* innocence; and by Mr. *Heath*, who thought fit to transmit it to posterity for *Gods* glory, and *mans* caution in judging and punishing. It would have been a great *omission* in me to have passed it by untouched.

20. Not long after, *viz.* in the year 1658. *Elizabeth* the servant of one Mrs. *Cope* of *Magdalen Parish Oxon*, was indicted at the *City Sessions* for killing her bastard child, and putting it in the house of *office*; of which being convicted, *she* was condemned to dye, and accordingly was hanged at *green-ditch*, the place

appointed for the *execution* of the *City malefactors*, where she hung so long, that one of the by-standers scrupled not to say, that if she were not *dead*, he would be *hanged* for her: hereupon being cut down (the *gallows* being very high) she fell with such violence on the ground, that it would have been enough to have been the death of many another *person*, only to have had such a fall. Being thus cut down, *she* was put into a *coffin* and brought to the *George Inn* in *Magdalen Parish* aforesaid, which when opened, they found perfect life in *her*, as in the former: whereupon breathing a *vein*, and putting her to *bed* with another *young wench* by *her*, *she* came quickly to *her self*, and might no question have lived also many *years* after; but having no *friends* to appear for *her*, *she* was barbarously dragg'd the night following by the order of one *Mallory* then one of the *Bayliffs* of the *City*, to *Glocester-green*, and there drawn up over one of the arms of the *Trees*, and hang'd a second time till she was dead.

21. After what concerns *women* solitarily consider'd, who according to the courtesie of *England*, have always the first place, come we next to treat of things unusual that concern *women* and *men* joyntly together; amongst which I think we may reckon many ancient *Customs* still retained *here*, abolish'd and quite lost in most other *Counties*: such as that of *Running* at the *Quinten*, *Quintain*, or *Quintel*, so called from the *Latin* [*Quintus*] because says *Minshew*°, it was one of the *Ancient Sports* used every fifth year amongst the *Olympian games*, rather perhaps because it was the *last* of the πένταθλοι, or the *quinque certamina gymnastica*, used on the *fifth* or *last* day of the *Olympicks*. How the manner of it was *then* I do not find, but *now* it is thus.

22. They first set a *Post* perpendicularly into the ground, and then place a slender piece of *Timber* on the top of it on a *spindle*; with a *board* nailed to it on one end, and a *bag* of *sand* hanging at the other; against this *board* they anciently rod with *spears*; now as I saw it at *Deddington* in this *County*, only with *strong staves*, which violently bringing about the *bag* of *sand*, if they make not good speed away it strikes *them* in the neck or shoulders, and sometimes perhaps knocks *them* from their *horses*; the great design of the *sport* being to try the agility both of *horse* and *man*, and to break the *board*, which whoever do's, is for that time accounted *Princeps Juventutis*.

• Minsh. ἡμεῶν εἰς τὰς γλῶσσας, in verbo.

23. For *whom* heretofore there was some reward always appointed, *Eo tempore* (says *Matthew Paris*) *Juvenes Londinenses, statuto Pavone pro bravio, ad stadium quod Quintena vulgariter dicitur, vires proprias, & Equorum cursus, sunt experti*: Wherein it seems the *Kings servants* opposing *them* were sorely beaten; for which; upon complaint, the *King* fined the *City*^p. Whence one may gather that it was once a tryal of *Man-hood* between two parties; since that, a contest amongst *friends* who should wear the *gay garland*, but now only in request at *Marriages*, and set up in the way for *young men* to ride at as they carry home the *Bride*, he that breaks the board being counted the *best man*.

24. To which may be added the observation of *Hoc-day*, *Hock-day*, *Hoke-day*, *Hoke-tide*, *Hoke-Monday* and *Hoke-Tuesday*: by all agreed to be a *Festival* celebrated in memory of the great slaughter of the *Danes* in the time of King *Ethelred*, they being all slain throughout *England* in one day, and in great part by *women*^q; whence it came to pass, that the *women* to this day bear the chief rule in this *Feast*, stopping all passages with *ropes* and *chains*, and laying hold on *passengers*, and exacting some small matter of them, with part whereof they *make merry*, and part they dispose of to *pious uses*, such as reparation of their *Church*, &c.

25. For which very reason some have thought it to be called *Hoke-Tide*, from the *German* or *High-Dutch*, *Hoge zeit*, i. e. *Tempus Convivii*, a time of Feasting; or the *Saxon* *hoegen*, which signifies a *Solemn Feast*; or perhaps rather from the *Anglo-Saxon*, *Deage tîs*, i. e. a *high Time*, or *high Day*: Others that thought the name respected the contempt that the *Danes* now lay under, amongst whom is Mr. *Lambard*, thought it so called, *quasi* *hucxtuesdæg*, i. e. *Dies Martis. irrisorius*^r, perhaps rather from *hogian temnere*: And others, that respected the manner of the celebration of the *Feast*, chose rather to derive it from the *German* *Hocken*, which signifies *obsidere, cingere, incubare*^s, to compass about, lay hold off, &c. as the *women* do on the *men* upon this day.

26. And as about the *name*, so about the *time* Authors differ much, some making *Hoke-day* to be the *Tuesday*, and others the *Monday* fourteenth night after *Easter*, and none of them on the

^p *Matth. Paris* sub initium *An. 1253.* edit *Watsonianâ*, p. 863. ^q *Vid. Watsii Glossarium in Mat. Paris.*
^r *Perambulation of Kent, in Sandwich.* ^s *Vid. Spelman. Glossarium in verbo.*

Danes massacre, which *Henry Arch-Deacon of Huntingdon*^c expressly says was on the Feast of *St. Brice*, i. e. the 13 of *November*. That it was formerly observed on *Tuesday*, not only *Mr. Lambard, ut supra*, but *Matthew Paris* also gives us testimony, *Et post Diem Martis quæ vulgariter Hoke-day appellatur, factum est Parliamentum Londini, &c*^u. And yet the same *Matthew Paris* in another place makes it to fall on the *Quinsieme* of *Easter*, in *Quindena Paschæ quæ vulgariter Hoke-day appellatur convenerunt Londini, &c*^w. which must needs be *Munday*; and the very same day it is observed here at *Oxford* in our times.

27. In so much that I once thought they might *anciently*, as well as *now*, observe two *Hock-days*, one for the *women*, and another for the *men*, but that I find the same *Matthew Paris* to mention the *Monday* before *Hoke-Tuesday*, and not calling it a *Hock-day* at all; viz. *Anno 1252*. where mentioning King *Henry* the *thirds* taking on him the *Crusado*, he says, he did it *die Lunæ, quæ ipsum diem proxime præcedit quem Hoke-day appellamus*^x. However it were *then*, it is most certain that *now* we observe *two* of them here, on *Monday* for the *women*, which is much the more solemn, and *Tuesday* for the *men* which is very inconsiderable; and yet neither of these perhaps was the *dies Martis ligatoria*, whatever *Sir Henry Spelman* may think^y, whereon *men* and *women* use to bind one another, that being now celebrated in some parts of *England* on *Shrove Tuesday*: Much less the same with the Feast of *St. Blase*, as *Minsheu*^z thinks, when *Country women* went about and made good cheer, and if they found any of their *Neighbor-women* a Spinning, set their *distaff* on fire; that Feast being celebrated on the third of *February*, and in all probability upon some other grounds.

28. Amongst things of this nature, I think we may also reckon an ancient Custom of the *Royalty of Ensham*, where it was formerly allowed to the *Towns-people* on *Whit-munday*, to cut down and bring away, where-ever the *Church-wardens* pleased to mark it out, by giving the first chop, as much *Timber* as could be drawn by *mens* hands into the *Abbey-yard*, whence if they could draw it out again, notwithstanding all the *impediments* could be given the *Cart* by the *servants* of the *Abbey* (and since that by the *family*

^c *Historiarum Libro 6. sub initium.* ^u *Matth. Paris in An. 1258. edit. Watf. p. 963.* ^w *Idem in An. 1255. edit. Watf. p. 904.* ^x *Matth. Paris edit. Watf. p. 834.* ^y *Vid. Spelman Glossarium in verbo.* ^z *Minsheu. ἡ μὴν εἰς τὰς γλώσσας, in verbo.*

of the *Lord*, it was then their own, and went in part at least to the *reparation* of their *Church*; and by this, as some will have it, they hold both their *Lammæ* and *Michaelmas Common*. But this *Custom*, now the *Timber* is almost destroyed thereabout, begins to be so inconvenient, that if it be not seasonably laid aside, it will discourage all people from *planting* it again, even about their very *houses*: for to what purpose should they do it, when it would still be in the power of a malicious *Church-warden* to give it a chop, and destroy it when he pleases. To prevent which great evil, I hear the chiefest of the *Parish* have lately combined, wherein I think they have done well enough, provided always that the Rights of the *Church* (whatever they be) be fully compensated some other way.

29. In the *Northern* part of *Oxford-shire*, about *Banbury* and *Bloxham*, it has always been the *custom* at set times of year, for young people to meet to be hired as *servants*; which meeting, at *Banbury* they call the *Mop*; at *Bloxham* the *Statute*, where they all sort themselves, and carry their *badges* according as they are qualified; the *Carters* standing in one place with their *whips*, and the *Shepherds* in another with their *crooks*; but the *maids*, as far as I could observe, stood promiscuously: which *custom* I had scarce I think noted, but that it seems to be as *old* as our *Saviour*, and to illustrate his *Parable* in *St. Matthews Gospel*^a, where the *laborers* are said to stand in the *mercato* to be hired.

30. And now I have run my self into *Divinity*, I cannot but note an odd *custom* at *Stanlake*, where the *Parson* in the *Procession* about *holy Thursday*, reads a *Gospel* at a *Barrels head* in the *Cellar* of the *Chequer Inn*, where some say there was formerly a *Hermitage*; others, that there was anciently a *Cross*, at which they read a *Gospel* in former times, over which now the *house*, and particularly the *cellar* being built, they are forced to perform it in manner as above.

31. But in matters of *Religion* there is nothing so worthy memory as the *Christian unanimity* of the *Parish* of *Brightwell*, where, through the exemplary *Piety*, and prudent conduct of that worthy Gentleman, the *Worshipful John Stone Esq;* Lord of the *Town*, and the Reverend *Mr. Fiddes*, *Rector* of the place, and their *Predecessors*, and the good disposition of the *people* them-

^a *Matth.* 20. v. 3.

selves, all matters both of Spiritual and Temporal concern, have been so effectually press'd, and prudently menaged, that there has not been known any such thing as an *Ale-house*, a *Seētary*, or *Suit of Law* commenced within the whole *parish* (which is of a large extent) in the memory of *man*: which being more for ought I know than any Parish in *England* can say beside, and so well worthy the imitation of all other *places*, I thought fit (for the eternal honor of its *Inhabitants*) to recommend it accordingly.

32. Yet but few miles off, at the *Town* of *Watlington*, I was told of a sort of *Seētaries*, perhaps never heard of in the *world* before; which if so, is as strange as the thing it self, for *one* would have thought there could have nothing been so absurd in *Religion*, but what must have needs been embraced already. These by the rest of the *people* are called *Anointers*, from the ceremony they use of *anointing* all persons before they admit them into their *Church*, for which they allege the fifth of *St. James*, v. the 14 and 15. *Is there any sick among you* (which it seems they account all people to be but themselves) *let him call for the Elders of the Church, and let them pray over him, anointing him with oyl in the name of the Lord; and the prayer of faith shall save the sick, and the Lord shall raise him up, and if he have committed sins they shall be forgiven him*: which *Elders* amongst them are some poor *Tradesmen* of the *Town*, and the oyl they use, that commonly sold in the *shops*, with which the *Profelyte* being smeared over, and fired with zeal, he presently becomes a new *Light* of this *Church*; which I could not but note, these *people* being as remarkably *mad*, as those of *Brightwell* are good. Though perhaps some may think one *Richard Hastings*, then of *Broughton*, and yet living near *Banbury*, more religiously *mad* than any of those; who with *Origen* understanding the twelfth verse of the nineteenth *Chapter* of *St. Matthews Gospel* literally, hath castrated, and so made himself an *Eunuch* for the Kingdom of Heavens sake.

33. And thus much of *men* and *women* jointly together in their *lives*; as to what concerns their *deaths*, I must add also a *Relation*, as strange as 'tis true, of the Family of one Captain *Wood* late of *Bampton*, now *Brise-Norton*, Captain in the late Wars for the *King*; Some whereof before their *deaths* have had signal warning given them by a certain *knocking*, either at the *door* without, or on the *table* or *shelves* within; the *number* of strokes, and

and distance between them, and the *place* where, for the most part respecting the circumstances of the *persons* to dye, or their *deaths* themselves, as will easily be collected from the following relation.

34. The first *knocking* that was heard, or at least observed, was about a year after the restoration of the *King*, in the afternoon a little before night, at or upon the *door* it being then open, as it was apprehended by Mrs. *Elenor Wood*, mother to Captain *Basil Wood*, who only heard it, none being then by or about the *house* but her self; at which she was very much disturbed, thinking it boded some ill to *her* or *hers*, and within fourteen nights after, she had news of the death of her Son in law Mr. *George Smith*, who dyed in *London*.

35. About three years after that, there were three great *knocks* given very audibly to all that were then in the *house*, viz. to the aforesaid Mrs. *Elenor Wood*, Mr. *Basil Wood*, and his wife Mrs. *Hester*, and some *servants*: which *knocks* were so remarkable, that one of the *maids* came from the *well* which was about twenty yards from the place, to see what was the matter; and Mrs. *Elenor Wood*, and another maid that was within the *house*, saw three great pans of *Lard* shake and totter so upon a shelf in the *Milk-house*, that they were like to fall down. Upon this violent *knocking*, Mr. *Basil Wood* and his wife being then in the *hall*, came presently into the *milk-house* to their mother, where finding her somewhat disturbed, and enquiring the reason, she replied, God *Almighty* only knew the matter, she could tell nothing but she heard the *knocking*; which being within doors, Mr. *Basil Wood* concluded must be for some of the Family at home, that upon the *door* being for a friend abroad: which accordingly fell out, three of the family, according to the number of the *knocks*, dying within little more than half a year after; viz. Mrs. *Hester Wood* wife to Mr. *Basil Wood*, a child of Mr. *Woods* sister, and Mrs. *Elenor Wood* his mother.

36. About August, 1674. Mr. *Basil Wood junior*, son of *Basil* aforesaid, living at *Exeter* in *Devon-shire*, heard the same kind of *knocking*, at which being disturbed, he wrote word of it to his *Father* here at *Bampton* in *Oxford-shire*; viz. That one Sunday, he and his wife, and her sister, and his brother, did distinctly hear upon a *Table* in their Chamber as they stood by it, two several

veral *knocks* struck as it were with a *cudgel*, one of them before, and the other after *Morning-prayer*, a little before *dinner*: which Letter was chewn by Mr. *Wood senior* (as the other *knockings* before the deaths of any that dyed, were before-hand told) to several neighboring *Gentlemen*. After which, within about fourteen days, Mrs. *Hester Wood* a second wife of Mr. *Basil Wood senior*, and about a quarter of a year after, her Father Mr. *Richard Lisset*, dyed both at *Bampton*; since which time they have heard nothing more as yet.

37. Amongst such unaccountable things as these, we may reckon the strange passages that happened at *Woodstock* in Anno 1649. in the *Manor-house* there, when the *Commissioners* for surveying the *Manor-house*, *Park*, *Deer*, *Woods*, and other the *Demeafnes* belonging to that *Manor*, sat and lodged there: whereof having several *relations* put into my hands; and one of them written by a learned and faithful *person* then living upon the place, which being confirmed to me by several *eye-witnesses* of many of the particulars, and all of them by one of the *Commissioners* themselves, who ingeniously confest to me, that he could not deny but what was written by that *person* above-mention'd was all true; I was prevailed on at last to make the *relation* publick (though I must confess I have no esteem for such kind of *stories*, many of them no question being performed by combination) which I have taken care to do as fully, yet as briefly as may be.

38. *October* the 13. 1649. the *Commissioners* with their servants being come to the *Manor-house*, they took up their Lodging in the *Kings* own rooms, the *Bed-chamber* and *with-drawing Room*; the former whereof they also made their *Kitchen*; the *Council-hall*, their *brew-house*; the *Chamber of Presence*, their place of sitting to dispatch business; and a *wood-house* of the *Dining-room*, where they laid the *wood* of that ancient *Standard* in the *high-Park*, known of all by the name of the *Kings Oak*, which (that nothing might remain that had the name of *King* affixed to it) they digged up by the *roots*. *October* the 14 and 15 they had little disturbance, but on the 16 there came as they thought, somewhat into the *Bed-chamber* where two of the *Commissioners* and their *servants* lay, in the shape of a *dog*, which going under their *beds*, did as it were gnaw the *bed-cords*; but on the morrow finding

finding them whole, and a quarter of Beef which lay on the ground untouched, they began to entertain other thoughts.

39. *October 17.* Somthing to their thinking removed all the wood of the *Kings Oak* out of the *dining-room* into the *Presence Chamber*, and hurled the chairs and stools up and down that room: From whence it came into the two *Chambers* where the *Commissioners* and their *servants* lay, and hoisted up their *beds* feet so much higher than the *heads*, that they thought they should have been turned over and over, and then let them fall down with such a force, that their *bodies* rebounded from the bed a good distance, and then shook the *bed-steds* so violently, that *themselves* confessed their *bodies* were sore with it. *October 18.* Somthing came into the *Bed-chamber* and walkt up and down, and fetching the *warming-pan* out of the *with-drawing room*, made so much noise that they thought five *bells* could not have made more. And *October 19.* *Trenchers* were thrown up and down the *dining-room* and at them that lodg'd there, whereof one of them being shaken by the shoulder and awakened, put forth his head to see what was the matter, but had *trenchers* thrown at it. *October 20.* the *curtains* of the *bed* in the *with-drawing room* were drawn to and fro, and the *bedsted* much shaken, and eight great *pewter dishes*, and three dozen of *trenchers*, thrown about the *bed-chamber* again, whereof some fell upon the *beds*: this night they also thought whole arm-fulls of the wood of the *Kings Oak* had been thrown down in their *chambers*; but of that, in the morning they found nothing had been moved.

40. *October 21.* The *keeper* of their *Ordinary* and his *bitch*, lay in one of the *rooms* with them, which night they were not disturbed at all. But *October 22.* though the *bitch* kennel'd there again (to whom they ascribed their former nights rest) both they and the *bitch* were in a pitiful taking; the *bitch* opening but once, and that with a *whining*, *fearful* yelp. *October 23.* they had all their cloaths pluckt off them in the *with-drawing room*, and the *bricks* fell out of the chimney into the room; and the 24th they thought in the *dining-room* that all the wood of the *Kings Oak* had been brought thither, and thrown down close by their *bed-side*, which noise being heard by those of the *with-drawing room*, one of them rose to see what was done, fearing indeed that his fellow *Commissioners* had been killed, but found no such matter; where-

whereupon returning to his *bed* again, he found two dozen of *trenchers* thrown into it, and handsomly covered with the bed-cloaths.

41. *October 25.* The *curtains* of the *bed* in the *with-drawing room* were drawn to and fro, and the *bedsted* shaken as before: and in the *bed-chamber* *glafs* flew about so thick (and yet not a pane of the *chamber* windows broken) that they thought it had rained *money*; whereupon they lighted candles, but to their grief they found nothing but *glafs*, which they took up in the morning and laid together. *October 27.* Somthing walked in the *with-drawing room* about an hour, and going to the *window* opened and shut it; then going into the *bed-chamber*, it threw *great stones* for about half an hours time, some whereof lighted on the *high-bed*, and others on the *truckle-bed*, to the number in all of about four-score. This *night* there was also a very great noise, as though forty *pieces* of *Ordnance* had been shot off together; at two several *knocks* it astonished all the *neighboring dwellers*, which 'tis thought might have been heard a great way off. During these *noises* which were heard in both *room* together, both *Commissioners* and *servants* were struck with so great horror, that they cried out to one another for help, whereof *one* of them recovering *himself* out of a strange *agony* he had been in, snatch'd up a *sword*, and had like to have killed one of his *Brethren* coming out of his bed in his shirt, whom he took for the *Spirit* that did the mischief: However, at length they got all together, yet the noise continued so great and terrible, and shook the *walls* so much, that they thought the whole *Manor* would have fell on their heads. At its departure it took all the *glafs* away with it.

42. *November 1.* Somthing as they thought walk'd up and down the *with-drawing room*, and then made a noise in the *dining-room*: The *stones* that were left before and laid up in the *with-drawing-room*, were all fetch'd away this night, and a great deal of *glafs* (not like the former) thrown about again. *November 2.* came somthing into the *with-drawing room* treading (as they conceived) much like a *Bear*, which first only walking about a quarter of an hour, at length it made a noise about the *Table*, and threw the *warming-pan* so violently, that it quite spoiled it: It threw also *glafs* and *great stones* at them again, and the *bones* of *horses*, and all so violently, that the *bedsted* and *walls* were bruised
by

by them. This night they set *candles* all about the *rooms*, and made *fires* up to the mantle-trees of the *chimneys*; but all were put out no body knew how, the *fire*, and *billets* that made it, being thrown up and down the *rooms*; the *curtains* torn with the *rods* from their *beds*, and the *bed-posts* pull'd away, that the *tester* fell down upon them, and the feet of the *bedsted* cloven in two: And upon the *servants* in the *truckle-bed*, who lay all this time sweating for fear, there was first a little, which made them begin to stir; but before they could get out, there came a whole *coule*, as it were, of stinking *ditch-water* down upon them, so *green*, that it made their *shirts* and *sheets* of that colour too.

43. The same night the *windows* were all broke by throwing of *stones*, and there was most terrible noises in three several places together, to the extraordinary wonder of all that lodged near them; nay, the very *Cony-stealers* that were abroad that night, were so affrighted with the dismal thundering, that for hast they left their *Ferret* in the *Cony-boroughs* behind them, beyond *Rosamonds well*. Notwithstanding all this, one of them had the boldness to ask in the Name of *God*, *what it was? what it would have?* and *what they had done, that they should be disturbed in this manner?* to which no *answer* was given, but the *noise* ceased for awhile. At length it came again, and (as all of them said) brought seven *Devils* worse than it self. Whereupon one of them lighted a *candle* again, and set it between the two *chambers* in the door-way, on which another of them fixing his *eyes*, saw the similitude of a *hoof* striking the *candle* and *candle-stick* into the middle of the *bed-chamber*, and afterwards making three scrapes on the *snuff* to put it out. Upon this the same person was so bold as to draw his *sword*, but he had scarce got it out, but there was another *invisible hand* had hold of it too, and tug'd with him for it, and prevailing, struck him so violently with the *pommel*, that he was stun'd with the blow.

44. Then began grievous noises again, in so much that they called to one another, got together and went into the *Presence-chamber*, where they said *Prayers* and sang *Psalms*; notwithstanding all which, the thundring noise still continued in other *rooms*. After this, *November 3.* they removed their *Lodgings* over the gate; and next day being *Sunday*, went to *Ewelme*, where how they escaped, the *Authors* of the *Relations* knew not;

but returning on *Monday*, the *Devil* (for that was the name they gave their nightly guest) left them not unvisited; nor on the *Tuesday* following, which was the last day they staid. Where ends the *History* (for so he was stiled by the people) of the just devil of *Woodstock*; the *Commissioners* and all their dependants going quite away on *Wednesday*; since which time, says the *Author* that lived on the place, there have honest persons of good *Quality* lodged in the *Bed-chamber* and *with-drawing room*, that never were disturb'd in the least like the *Commissioners*.

45. Most part of these *Transactions*, during the stay of these *Commissioners*, 'tis true, might be easily performed by *combination*, but some there are of them scarce reconcilable to *Jugling*: Such as 1. The extraordinary *noises*, beyond the power of *man* to make, without such *instruments* as were not there. 2. The raring down and splitting the *bed-posts*, and putting out so many *candles* and so great *fires* no body knew how. 3. A visible *shape* seen of a *horses* hoof treading out the *candle*. And 4. a tugging with one of them for his *sword* by an *invisible hand*. All which being put together, perhaps may easily persuade some *man* otherwise inclined, to believe, that *immaterial beings* might be concern'd in this business; which if it do, it abundantly will satisfy for the trouble of the *Relation*, still provided the *speculative Theist*, be not after all, a *practical Atheist*.

46. And thus, before I am aware, being fallen amongst the *unusual accidents* that have happened to *men only*, the next unaccountable thing that presents it self, is a remarkable *Dream* of *Thomas Wotton Esq;* of *Bocton Malherb* in the County of *Kent*, Father to the famous Sir *Henry Wotton* Provost of *Eaton*, whose *dreams* did usually prove true, both in fore-telling things to come, and discovering things past. The *dream*, 'tis true, of which I am now writing, was had at *Bocton* in *Kent*, but the most important concern of it relating to *Oxford*, I thought fit rather of the *two* to place it here; the particulars whereof, as taken *verbatim* out of Sir *Henry Wottons* life^b, are briefly these.

47. *This Thomas Wotton, a little before his death dreamed, that the University Treasury was robbed by Towns-men and poor Scholars, and that the number was five. And being that day to write to his Son Henry (then a Scholar of Queens College) at Oxford,*

^b *Inter Reliquias Wottonianas.*

he thought it worth so much pains, as by a *Postscript* in his Letter, to make a slight enquiry of it. The Letter (which was writ out of Kent, and dated three days before) came to his Sons hands the very morning after the night in which the robbery was committed; and when the University and City were both in a perplext inquest of the Thieves, then did Mr. Wotton shew his Fathers Letter, by which such light was given of this work of darkness, that the five guilty persons were presently discovered, and apprehended.

48. Amongst the *unusual accidents* attending men in their Lives, we must also reckon all *unusual diseases*, such as that of Mr. Evans Rector of Heath, who had a *Ranula* under his tongue, wherein there bred a Stone, I suppose è *sanguine crasso & terrestri*; or as they call it, a *Tartareous* humor got together in the veins under the tongue, so hard and great that it almost quite deprived him of his speech; which he drew away with his own hand, and as he told me sent it to the *Medicin School* at Oxford; but upon search I could not find it, nor had the *School-keeper* ever heard of any such matter: So that whoever he were that he sent it by, proved false both to him and the University; which I the rather note, that people hereafter may take more care by whom they send such matters. Of just such another stone as this Mr. Lister gives us an account in a Letter to his Grace the Arch-Bishop of York^c, cut from under the tongue of a man, and now preserved in the Repository of the *Royal Society*, which he chuses to call *Lapis Atheromatis*, though the place of its birth made him allow the distemper to be a *Ranula*: but for my part, though the *Ranula* be always a tumor, and sometimes perhaps of that sort they call *Atheromata*; yet the place giving the disease a peculiar name, I think I ought rather to call it *Lapis Ranulae*, from the place of its birth, and those only *Lapides Atheromatis* found in that tumor in other places of the body.

49. To this may be added a large stone taken out of the bladder of one Skingley of Oxford, weighing above a pound, and being ten inches round one way *ferè*, and full eleven the other; preserved, and now to be seen in the *Medicin School*. As also a Corn that grew on the Toe of one Sarney a Wheel-wright, of St. Aldates Parish in the City of Oxford, Anno 1655. two inches long, which for the unusual figure and bigness of it, I have caused to

^c Philosoph. Transact. Numb. 83.

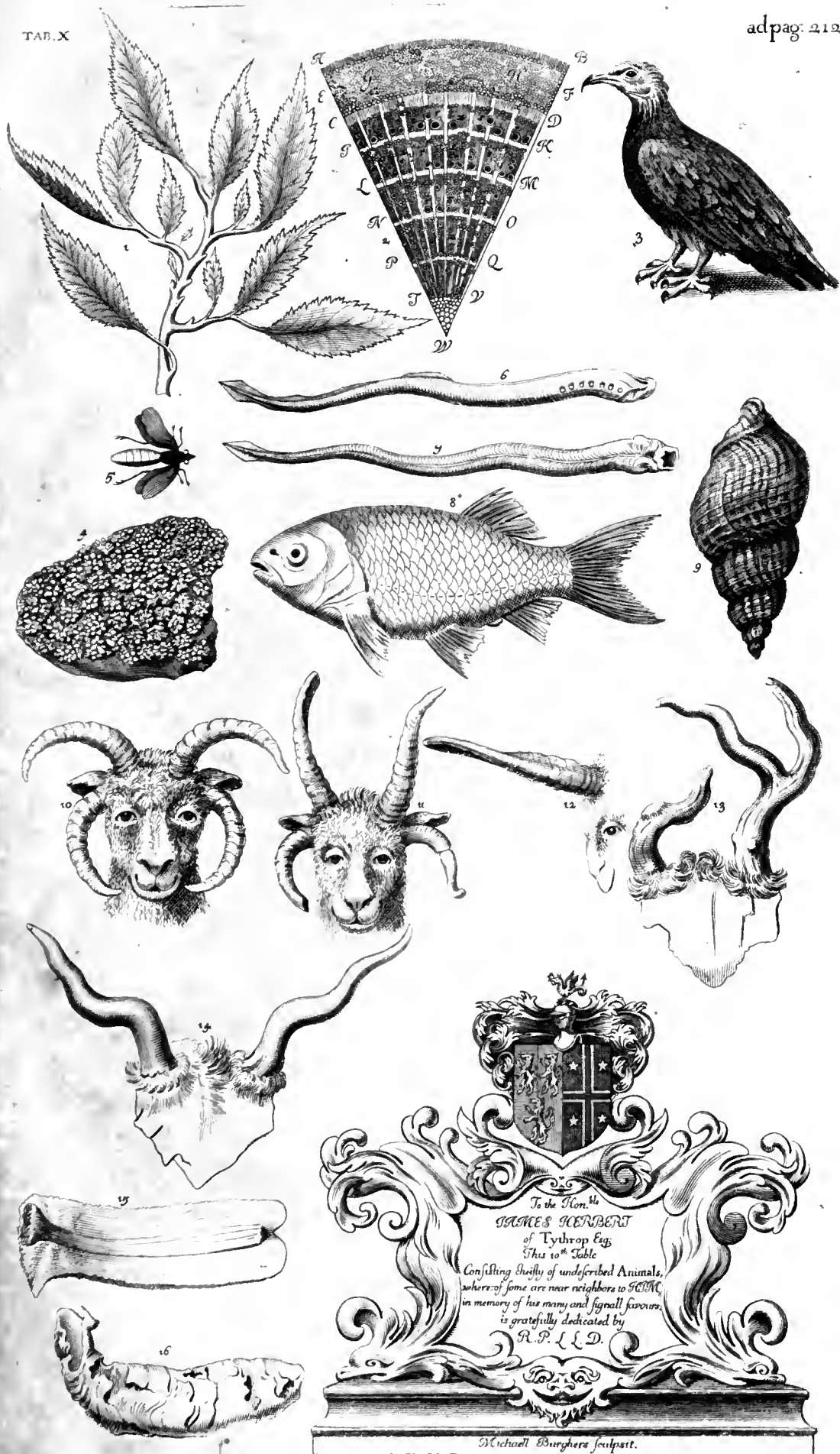
be ingraven of its just magnitude, *Tab. 10. Fig. 16.* which is also to be seen in the *Medicin School.*

50. Amongst which also I think we may number the descending trunk of the *Arteria magna*, taken out of the body of an ancient person, by the skilful Mr. *Pointer* Chirurgion of *Oxford*, in the presence of Dr. *Millington* our *Sidleyan Professor* of *Natural Philosophy*, whose innermost coat from above the *Emulgents* down to the *Iliac* branches, is by parcels only (and not continued throughout) turned into *bone*, the outer coat remaining soft and tender in its ordinary state; which *Artery* remains to be seen in the custody of Mr. *Pointer*. Just such another *Artery* as this, I find observed by *Fallopious*^d; and Dr. *Willis* took another of them out of a man much used to wine and stale drinks^e; who also informs us, that in the dissection of one that dyed of an ulcerated *Schirrus* in the *Mesentery*, he found one of the *Carotides* turned into *bone* in the same manner^f: Beside, above the *Emulgents* nearer the heart, there was a portion of this *Artery* turned into an *annulary bone*, perhaps such another as was observed by Dr. *Harvey*, and *Veslingius*^g, in the great *Artery* of an old man; but this I have not seen, it being in the possession of our afore-mention'd *Professor* residing in *London*.

54. Amongst other the fore-runners of death and the grave, we must not forget extream old age, such as those above-mentioned, §. 3. of the *second Chapter*; and of one *Josias Pierce* late of *Witney*, better known by much by the name of *George Jüs*, who lived to the age of an hundred and twelve. Where also in the Tithing of *Curbridg* there is one *William Carter* now living, at least a hundred years old, who yet it seems has not lived more abstemiously than others of his rank, nor do's he now at this age take so much care, as other people of his health: he commonly lying naked amongst the *blankets* of the *Mill* where he lives, which many times are not over dry; out of which he will go naked in the midst of *winter*, and drink cold water at the *Rivers* side.

52. Of accidents in the very point of death, I have met with none observable amongst the *Men* of this *County*, nor of any attending them in the *Grave*, except we may reckon that one, of preservation from corruption many years after death; such as that

^d *Gabr. Fallop. Tom. 2. Tract. 9. cap. 14.* ^e *Pharmaceut. rationalis, sect. 6. cap. 3.* ^f *Cerebr. Anatom. cap. 7.* ^g *Syntag. Anatom. cap. 10.*



of the body of *one* that had been *Reſtor* of *Wendlebury*, taken up in the *Church* there near forty years after he had been buried, whoſe fleſh yet look'd as *red* (as I was informed by the *Incumbent*, ſince alſo dead) as *raw beef*: which whether it might not be cauſed by the *petrifying* qualities of the *earths* and *waters* about that *Town*, would be an experiment worthy the trial of the *Ingenious* thereabout; or about *Sommerton* or *North Aſton*, where it would be eaſie to try whether fleſh were ſo inclinable to corrupt in *petrifying* waters as *others*. But if this prove the cauſe, all *bodies* muſt equally be preſerved there, as well as that. *De quibus quære.*

53. And thus I had finiſh'd this *eighth Chapter*, but that I muſt beg leave to acquaint the *Reader*, that ſince the Printing the 21 §. of it, I have found the *Quintana* amongſt the *Roman* exerciſes (which yet perhaps they might borrow from the *Greeks*) by the name of *Quintana*; ſo called, by reaſon the *Romans* in their *Tents* made firſt *four ways* in manner of a *Croſs*, to which adding a *fiſth* on one ſide, it was called *Quintana* *. In this way they ſet up a great *Poſt* about ſix foot high, ſuitable to the ſtature of a *man*, and this the *Roman* Soldiers were wont to aſſail, with all Inſtruments of *war*, as if it were indeed a real *enemy*; learning upon this, by the aſſiſtance of the *Campidoſtores*, how to place their blows aright. And this they otherwiſe called *exercitium ad Palum*; and ſometimes *Palaria*, the form whereof may be ſeen in *Vulturius* *: which practice being in uſe during their *Government* here, in all likelyhood has been retained among us ever ſince, being only tranſlated in times of Peace, from a *military*, to a ſportive marriage exerciſe.

* Vid. Guid. Pancirollum, Rer. memorabilium, lib. 2. tit. 21: * In Auguſtanis Monumentis, p. 237.

CHAP. IX.

Of Arts.

THUS having run through all the *Natural Bodies* I have met with in *Oxford-shire*, such as either *Dame Nature* has always retained the same from the beginning, as *Waters*, *Earths*, *Stones*, &c. or freely produces in her ordinary course, as *Plants*, *Animals*, with all her *extravagancies* and *defects*, or other *accidents* attending: I am come at length, according to my proposed *method*, to treat of *Arts*, and *things artificial*, that have either been *invented* or *improved* in this *County*; whereof first, of such as have tended to the discovery of the *magnitudes*, or determination of the *motions* of the *Heavenly Bodies*, whither also must be referr'd the contrivance of new *Periods*, of new *Hypotheses* and their *demonstrations*. Secondly, I shall consider *Air*, *Fire*, and *water-works*, and thence go on to such *Arts* as have any relation to *Earths*, *Stones*, or *Plants*. In short, I shall here also follow the *method* of the whole *Essay* as in some other *Chapters*, by the way taking in all *Inventions*, and *improvements* that I have met with in this *County*, whether in the *Mechanick* or *Liberal Arts*; which I intend the whole *scope* of the following *Chapter*.

2. The first *Celestial Observations* in order of time, made here, that were any thing *artificial*, I presume might be done by *Robert Grossthead* Bishop of *Lincoln*, *crassi quidem capitis, sed subtilis ingenii*, says *Pitsens* of him^h; who amongst other his *Learned works*, left us *Treatises* of the *Sphere* and the *Astrolabe*, with which no question he found out many things that were *new* to that age: But because we can instance in no *particulars*, let it suffice as an evidence of the great probability, that he is highly commended for his knowledge in *Astronomy* and *Perspective* by *Roger Bacon* a *Frier minor* of *Oxon*: and sometime Fellow of *Merton College*, a Man of such affrighting skill in *Mathematicks*, especially *Perspective*, that he justly deserved the title of *Dr. Mirabilis*. Nor indeed was he out of the way who gave him so much, since had he

^h In Anno 1253.

lived in our days we could have given no less, to one who in all probability was a great *Improver* at least, if not the *Inventor* of that useful *Mathematical Instrument*, since by *Galilæus* and others called the *Telescope*; of which admirable *Invention* perhaps *Oxford* may justly boast, and for it expect to be celebrated to all *posterity*. Which assertion if made good with all perspicuity and clearness, without wresting any words or begging favorable construction, I think I need not to doubt but on all hands 'twill be granted, that the *observations* here made as they were *new* and *frequent*, so to the *vulgar* and ignorant, they must needs be *terrible* and *amazing*.

3. That this Learned *Frier* understood all sorts of *glasses*, and to order and adapt them to such like purposes (not to cite other *places* that might easily be brought) I think I may with *truth* as well as *confidence* affirm from the unconstrained sense of his own words, in his Book of *Perspective*. *Si vero corpora non sunt plana per quæ visus videt, sed spherica; tunc est magna diversitas, nam vel concavitas corporis est versus oculum, vel convexitas*¹. But, says he, if the *glasses* be not plain (having treated of them before) but *spherical*; the case is much otherwise, for either the *concavity* of the *glass* is next the *eye*, or the *convexity*, &c. Now that he used these *glasses* in *Celestial Observations*, is altogether as evident from the same *Book*, where he proceeds in these words. *De visione fractâ, majora sunt, nam de facili patet, maxima posse apparere minima, & è contra; & longe distantia videbuntur propinquissime, & è converso: sic etiam faceremus Solem, & Lunam, & Stellâs descendere secundum apparentiam hic inferius, &c*^k. Greater things are performed if the *vision* be *refracted*, for [by *refraction*] 'tis easily made appear that the *greatest things* may be represented *less*, and *little things* as the *greatest*; and that things *a far off* may be represented *near*: Thus we can make the *Sun*, and *Moon*, and *Stars*, to all appearance, to come down to us here below, &c.

4. Again in his *Epistle ad Parisiensem*, concerning the secret works of *Art* and *Nature*. *Possunt enim sic figurari perspicua, ut longissime posita, appareant propinquissima, & è contrario; ita quod ex incredibili distantia legeremus literas minutissimas, & numeraremus res quantumcunque parvas, & stellâs faceremus apparere quo vellemus*^l. *Glasses* may be so figured, that things the most *remote* may appear

¹ *Perspectiv. part. 3. dist. 2. cap. 3.* ^k *Ibid. dist. ultima.* ^l *In Epist. ad Parisiensem, cap. 5.*

near ; so that at an *incredible distance* we may read the smallest *Character*, and number *things* though never so *small* ; and lastly, make *Stars* appear as *near* as we please. And *these things*, he says at another place, were to the *illiterate* so formidable and amazing, *ut animus mortalis ignorans veritatem non possit aliququaliter sustinere* ^m : that no *mortal*, ignorant of the means, could possibly bear it.

5. Wherein this Learned *Franciscan* did so far excel the ancient *Magicians*, that whereas they represented the *Moons* approach by their *magical charms*, he brought *her* lower with a greater innocence, and with his *glasses* did that in *truth*, which the ancient *Poets* always put in a *Fable* : thus *Petronius* brings in his *Witch*, boasting the power of her *charms*.

—*Lunæ descendit imago*
Carminibus deducta meis.

And *Martial* ⁿ in the *Epitaph* of *Philænis* enquires,

Quæ nunc Thessalico Lunam deducere Rhombo
Quæ sciet?

All which put together, it must necessarily be confest, that *he* had some such *Instrument*, though not so trimly made, 'tis like, as our *Telescopes* are now. In favor of which truth, much more might be alleged, did I not think this sufficient to evince it with unprejudiced *Readers*, for whose benefit I have laid down his words thus at large, and translated them (as I also intend in some other matters) that such as have not the opportunity of seeing his *Books*, or understand not his *Language*, might give their verdict, as well as *those* that have, or do.

6. Upon the account of these, and many other excellent *Experiments*, exceeding ('tis true) the *capacity*, but not the *malice* of those times, he was accused of *Magick* in its worst sense, to have performed them by the concurrent help of the *Devil*^o, persecuted as such by those of his own *Fraternity*, and thrown into Prison by *Hieronymus de Esculo*^p, General of his Order, afterward Pope by the name of *Nicholas the Fourth*, where they so barbarously treated him, that he was forced to seek redress of *Clement*

^m *Perspectiv. part. 3. dist. 3.* ⁿ *Martial. Epigram. lib. 9. Epig. 22. vers. 30.* ^o *Vid. Histor. & Antiq. Univ. Oxon. Lib. 1. p. 138.* ^p *Balei Cent. 4. Numb. 55.*

the Fourth, to whom he made complaint not only of his hard usage, and sequestration of his Books, but charge of his Experiments, some whereof he tells him, especially concerning burning things at any distance, would amount at least to a thousand marks; *Et certe combustio in omni distantia constaret plusquam mille marcae, antequam specula sufficientia fierent ad hoc*^a, are his very words. And at another place speaking of Mathematical Instruments; *Instrumenta hæc non sunt facta apud Latinos, nec fierent pro ducentis nec trecentis libris*^r, that they would not be made for two or three hundred pounds: great sums indeed in Bacons time, yet scarce bearing proportion with his greater attempts.

7. Which made them at last so jealous of him, that notwithstanding he wrote a whole Treatise against the use of Magick^s; they would suffer none to come near him, nor his Books to have place in their Libraries, insomuch that it almost repented him of his Inventions^r, which in all probability (not to mention the humor of the Age, very careful of breaking the Heavenly Seal (as they called it) which obscured their mysteries from the unworthy multitude) was the cause why he left us no particular Phenomena of the motions of the Planets, nor any thing of new stars; the disclosing such secrets producing many inconveniencies. Which also was the reason (as guess'd by Dr. Dee^u) why he never revealed his secret of Gun-powder; not but he esteemed it a considerable Invention, but because he fore-saw the many evils attending it, which these latter ages have severely felt; since brought into practice by Bertholdus Swartz, of which more fully in its proper place.

8. So far then was John Lippersein of Zeland, Metius of Alckmar, or Galileus himself from being the Inventor of the Telescope, or first applyer of it to the Heavens; that perhaps had not Bacon left his Books to posterity, with such pregnant Indications how much might be done that way; he had been as little able to make those advancements he did, as Paulus Middleburgensis, or Copernicus had been, to give occasion for the correction of the Julian Calendar, or Tropical Year, consisting of 365 days and 6 hours (first contrived, as Bacon informs us, by one Felix^w, and only

^a In Operis Min. part. 3. cap. 13. MS. in Bib. Bod. ^r In eadem Op. Min. part. 3. cap. 11. ^s Contra Necromanticos sive de nullitate Magiæ. ^t Vid. Hist. & Antiq. Univ. Oxon. Lib. 1. p. 138. ^u Dr. Dee's Annot. in Epist. ad Parisiensem. ^w In Libro Fratris Rog. Bacon. Computus Naturalium, dicto, cap. 2 MS. in Bibl. Coll. Universitatis Oxon.

perfected by *Cæsar*) which though not performed till the time of *Gregory* the 13th, Anno 1582. yet the *first motion* of its being done, was certainly made by this Learned *Friar* to Pope *Clement* the 4th, as appears from a fair MS Copy of the fourth part of his *Opus minus* in the *Bodleian Library*: Where after he has passionately lamented its errors awhile, he gives this succinct account of it, viz. that its being greater than the true *Solar* year, was the cause of the going back of the *Æquinoxes* and *Solstices*, and then how all was to be amended.

9. *Quod autem hic intendo* (says he^x) *est de correctione Calendarii quo utitur Ecclesia. Julius quidem Cæsar in Astronomia edoctus complevit ordinem Calendarii secundum quod potuit in tempore suo; & sicut Historiæ narrant contra Achorium Astronomum, & Eudoxum ejus Doctorem disputavit in Egypto de quantitate Anni Solaris, super quam fundatum est Calendarium nostrum, unde sicut Lucanus refert, ipse dixit*

Non meus Eudoxi vincetur fastibus Annus.

Sed non pervenit Julius ad veram anni quantitatem quam posuit esse in Calendario nostro 365 dies, & quartam diei integram, quæ quarta colligitur per quatuor annos, ut in anno Bissextili computetur unus dies plus quam in aliis annis communibus: Manifestum autem est per omnes computistas, antiquos & novos, sed & certificatum est per vias Astronomiæ, quod quantitas anni Solaris non est tanta, imo minor; & istud minus æstimatur à sapientibus esse quasi 130 pars unius diei, unde tanquam in 130 annis superflue computatur unius dies, qui si auferretur, esset Calendarium correctum quoad hoc peccatum, i. e.

10. That which I intend here (says he) is the correction of the *Calendar* now in use in the Church. *Julius Cæsar* indeed being learned in *Astronomy*, compleated the *Calendar* very well for his time, and as *Histories* tell us, disputed in *Egypt* against *Achorius*, and his Master *Eudoxus*, concerning the quantity of the *Solar* year, on which our *Calendar* is founded, which made *Lucan* bring him in speaking to this effect,

*The Julian, shall ne'r be prov'd amiss,
By the Eudoxian Ephemeris.*

But *Julius* never came to the knowledge of the true quantity of

* 4^o MS. in Bib. Bod. in Museo Protobibliothecarii p. 327.

the year, which he made to consist of 365 days, and a whole fourth part of a day. which fourth part collected at four years end, made, that in the *Bissextil* there was one day more than in any other year: But 'tis manifest (says he) to all *Astronomers* both old and new, and 'tis plain from the rules of *Astronomy*, that the quantity of the *Solar* year is not so much, but less, and that as 'tis judged by wise men, by the 130th part of a day; whence it comes to pass, that in 130 years we have one superfluous day, which were it but taken away, the *Calendar* would be corrected as to this error.

11. And then he proceeds to shew, that upon this account it is that the *Æquinoxes* and *Solstices* are not fixt, but continually ascend in the *Calendar*, that in the beginning of the *Church* they were not, where they are now in his time; and in the conclusion of the Discourse, *Debet autem nunc temporis remedium apponi propter istos errores manifestos, &c.* But that now some remedy must be found for those palpable errors, and that to take off scandal from the *Church*; for (says he) all the learned in *Astronomy* know this, and laugh at the ignorance of the *Prelates* that suffer it. Nay, the Infidel *Arabians*, *Hebrews*, and *Greeks*, abhor the folly they see in the *Christians* in ordering the time they set aside for their greater *Solemnities*: But now *Christians* have so much skill in *Astronomy*, that they can amend all these things. Therefore your *Holyness* (meaning *Pope Clement*) may command, & *invenietis homines qui præclara remedia apponent in hac parte.*

12. Thus earnestly wrote he for the reformation of the *Calendar*, not only in this but in several other Books; in one whereof he makes also this complaint, *Non tamen aliquis præsumit tradere Calendarium correctum, propter hoc quod Concilium generale prohibet ne quis mutet Calendarium, sine licentia sedis Apostolicæ generalis, i. e.* Yet no body presumes to correct this *Calendar*, because it is forbid by a *General Council* that no man should offer to alter it, without special license first obtained of the *Apostolick See*. Which license I gather at length was given him, for I find him in the end of the aforesaid *Chapter*, mentioning a more correct Copy of a *Calendar* sent to the aforesaid *Pope* by his Boy *John*, than any he had sent him before. *Cum propter festinantiam, & propter*

¹ Loco citato sub finem Paragraphi. ² In Operis Minor. part. 3. 4^o. MS. in Bibliotheca Bodleiana. cap. 67.

occupationes in aliis magnas & varias, vestrum Exemplar non fuit usquequaque correctum, hic iterum feci transcribi, & correxi; & hæc ideo facio, ut certitudinaliter considerare & conferre possitis de hac materia cum quocunque velitis, i. e. because upon the account of haste and various other businesses intervening, your Copy was not sufficiently correct, I have corrected and transcribed it again, that you might consider and confer about it more certainly with whom you please. A perfect and fair MS. Copy of which *Calendar*, I hear yet remains in the hands of one Mr. *Theyer*, a Gentleman of *Glocester-shire*.

13. From which, or some other *Calendar* of his, *Paulus Middleburgensis* Bishop of *Fossombrone*, in the *Dukedom* of *Urbino*, stole half of his great Volum, which he calls his *Paulina*, concerning the true time of keeping *Easter*, and day of the *Passion* of our Lord *JESUS*; directed to Pope *Leo the Tenth*, in order to the reformation of the *Roman Calendar* and *Ecclesiastical Cycles*, written just in the same order and method generally and particularly as *Roger Bacon* long before had done to *Clement the Fourth*; and yet full slender mention (says Dr. *Dee*^a) doth this *Bishop* make of him, though his chief Instructor in the best part of the matter contained in his *Book*: In which design, though the *Plagiary* were unsuccessful, his endeavors being frustrated for a time, yet 'twas he that stirred up *Nicholas Copernicus* (as the same *Nicholas* honestly confesses in an *Epistle* of his to *Paul the Third*^b) more accurately to observe the motions of the *Sun* and *Moon*, and thence to define the quantities of years and months more truly than they were before in the *Julian Calendar*; upon whose foundations *Aloysius*, and the rest of the sumptuous *College* of *Mathematicians* at *Rome* having built their *Reformation*, it is easily deducible that whatever has been done in this matter from the time of *Frier Bacon*, to that of Pope *Gregory the Thirteenth*, must in great measure be ascribed to him, their whole *Reformation* scarce differing from his.

14. Only in this (which is well worth the observation) that whereas the *Gregorian Reformers* reduced the *Equinoxes* and *Solstices* to the places they supposed they held in the time of the *Nicene Council*, *Bacon* seems inclinable to have brought them (and

^a Dr. *Dees* proposal to Queen *Elizab.* and her *Council* concerning the reformation of the vulgar *Calendar*. MS. in *Biblioth. C.C.C. Oxon. lit. Z. fol.* ^b In *Præfat. in libros revolutionum*.

that most rationally) to their places, in a much more eminent *Epoche*, viz. the *Winter Solstice* to the tenth of the *Calends* of *January*, and the *Vernal Æquinox* to the tenth of the *Calends* of *April*, their true places at the time of Christs birth: which he proves by a very cogent Argument drawn from the observations of *Ptolomy*, who lived but 140 years after Christ; in whose time the *Vernal Æquinox* was found to be on the eleventh of the *Calends* of *April*: now allowing, as before, that it ascends in the *Calendar* a whole natural day in 130 years; if in *Ptolomies* time it fell on the eleventh of the *Calends* of *April*, it must needs at Christs birth have been at least on the tenth; and so of the *Solstice* *. According to which computation they have now gon back in our *Calendar* since Christs time almost 13 days, the number 130 days being so often to be found in 1676. wanting but 14. Now the *Æra* of Christs birth being a time of much higher value, and more to be respected by Christians than the *Nicene Council*, in what ever else they have exceeded him, I am sure in this they have fallen short of his reformation.

15. And so much for the invention of the *Telescope*, and other *Instruments*, by the assistance whereof he so nearly defined the true quantities of the *Solar* and *Lunar years*, that he first gave occasion to the reformation of the *Julian Calendar*: wherein if the *Reader* (with me) be convinced, let him hither refer those inordinate *Encomiums* by *Kepler*, *Fabricius*, and *Cæsar la Galla*, heaped on *Galileus* for the one; and whatever else of that nature he shall meet with, given to *Paulus Middleburgensis*, *Copernicus*, or *Aloysius* for the other.

16. Thus was the Christian World first informed in matters of *Astronomy* by *Roger Bacon*, and with so much success here in *England*, that in the next *Century* we meet with *Richard Wallingford* Abbot of *St. Albans*, and *Simon Bredon*, both *Oxford* men, the most eminent for their time in the whole World: who for their subtilty, and yet clearness of demonstration, we find yoaked with no less than the great *Albategnius*, by *Lewis Caerlyon* also an *Oxford* man, in his observations of the *Eclipses*, *An. Dom. 1482* °, where also he treats of the *oblique ascensions* of the *Signs* calculated to the *Meridian* of *Oxford*. And quickly after we meet with

* In *Operis Min. part. 3. cap. 69.* MS. in *Bibliotheca Coll. Univers.* ° 4^o MS 79. inter *Codices MS. Seldeni.*

William Rede (after Bishop of Chichester) and John Eschenden jointly to carry on this study, as appears from their Treatises of the central Eclips of the Moon, and conjunction of the three superior Planets that happen'd An. 1345. and the great conjunction of Jupiter and Saturn, An. 1365. both which were calculated by William Rede, and the Prognostications added by John Eschenden^d: From which Eclips, and the first conjunction, he fore-told the Epidemical Pestilence that followed in the year 1349. which beginning in Turkey, spread all over Syria and Greece; whence it came into Italy, Spain and France, and at length into England. To these add John Somer and William Wyrcester, also most eminent Astronomers; the former whereof corrected the Calendar perhaps yet more accurately than Bacon^e; and the latter wrote a verification of all the fix'd stars, as to their longitude and latitude, for the year 1440^f. with some other Astronomical matters, at the instance of his Patron Sir John Falstoff.

17. Great we see was the increase of this sort of Learning, even in those days, yet that former Ages may not carry away the whole honor, let us also make an estimate of its modern advancements; such as it received from Thomas Lydiat, formerly Fellow of New College, and Rector of Alkerton in this County, who defining a yet truer period than any of the former, of the Sun and Moons motion (without which, there could be no accurat System or Calendar of years, months and days) most happily first contrived the Octodesexcentenary Period: *ipse primus, absit dicto invidia, nostro seculo observavi*, are his own words^g: Which Period, though till now not so certainly known, by Learned Antiquity, was called the great year, as is manifest from Josephus his History of the Jews^h, where speaking of the great advantages our Forefathers had in Astronomy, he says, Πλέον ζῆν τ' Θεὸν αὐτοῖς παραχεῖν, ἀπερ ἐκ τῆν ἀσφαλῶς αὐτοῖς περιεπεῖν, μὴ ζήσασιν ἑκατησίαις ὀνιαυτοῖς, ὅτι ποσέπων γὰρ ὁ μέγας ὀνιαυτὸς πληρῆται. i. e. that 'tis probable God gave them a longer life, that they might fully understand the Theorems of Astronomy, which they could not well do, unless they lived six hundred years; for the great year, says he, is accomplish'd in that number of years.

18. Which Lydiat found to come so near the truth, that there

^d Fol. MS. 176. inter Codices Digby. ^e Quod. vid. inter Codices Digby, 12^o MS. 5. ^f MS. inter Codices Laud, 12^o. B. 23. ^g Lydiati Ep. Astronom. de Anni Solaris mensura. ^h Lib. 1. cap. 4. sub. finem.

needed but the abatement of eight in six hundred, his true *period* consisting of 592 years, and that (according to *Geminus*) of whole years, whole months, and whole days, as a *period* ought to do¹, viz. of 592 intire solar years, 7322 entire months (whereof 218 are *intercalary*) 216223 entire days, and 30889 entire weeks; defining every *Lunar month* to consist of 29 days, 12^h, 44', 3", 12", 44", 3", 12". And the solar year of 365 days, 5^h, 47', 50", 16", & 8⁸/₃₇; or 5^h and 59⁹/₇₄; or 365 days and 1¹/₁₈ part of a day: So that the whole *period*, or 592 *Lydiat*ean years, do anticipate so many *Julian* ones by five days.

19. According to this *period* found out in *An.* 1605. exceeding the *Dionysian* but 60 years, he calculated the middle motions of the seven Planets for the nine first *periods* entirely, and the tenth so far forth as it had gon in his time; (some MS. fragments of which calculations I had lately in my possession, but now disposed of to the Worshipful Dr. *Lanphire*, Principal of *Hart-hall*, carefully to be preserved amongst the rest of his writings.) And in *An.* 1620. viz. in the last year of the first half of his tenth *period*, he put it forth, with his *Menologium*, or reformation of the *Calendar*, which he opposed to the new, but confused, absurd, and false *Pontifical Gregorian year*, contrived by the sumptuous College of *Mathematicians* at *Rome*; and defended it against the obtractions of *Joseph Scaliger*^k, a man, 'tis true, of great Learning, but withal so confident and imperious, so abusive and assuming, that whenever he wanted Arguments for the support of his cause, he always sought revenge upon the person of his Adversary.

20. Which was manifestly the case of modest *Lydiat*, whom in an *Epistle* to *Richard Thomson* (his correspondent in *England*) he calls, the greatest monster that ever *England* produced^l; and in another to the same *Thomson*, the veryest fool in the whole world, and that 'twas below his dignity, nor had he leisure to write against such a Beetle^m. But herein (as the Reverend Dr. *Heylin* very well notes in another case) we must pardon *Joseph*; for had not scorn and contempt been part of his *Essence*, he had neither been a *Scaliger*, nor the son of *Julius*ⁿ, who scrupled not to pass this rash censure on the whole *English Nation*; that we are, *Perfidi, inflati, feri, con-*

¹ *Periodus debet comprehendere, ὅλως ἡμέρας, καὶ ὅλως μῆνας, καὶ ὅλως αἰωνοὺς.* *Geminus* in libro *Φανερόν*.
^k Vid. *Lydiati Solis & Lunæ periodum*, in Titulo. ^l *Jos. Scaligeri Epistolar. lib. 3. Epist. 240.* ^m *Jos. Scaliger. Epistol. lib. 3. Epist. 241.* ⁿ *Cosmograph. in Cald. Assy. & Mesopot. sub finem.*

temptores, solidi, amentes, inertes, inhospitales, immanes°. In which very act yet I think he proves nothing, but that most of those *Epithets* rather belong to *himself*.

21. If it be objected that *Joseph* did not so far *patrizare*, but that he spake Honorably of some of the *English*, such as *Wotton*, *Savil*, *Camden*^r, *Reynolds*^q: it must be answered, That these touched not the *apple* of his eye, nor endeavored the ruin of his great *Diana*, the *Julian Period*, of which he conceited himself the *Inventor*: which yet since by an indifferent, and that a competent *judge*, is given to *Robert Lorringe* an *English* Bishop of *Hereford*, who lived 500 years before *Scaligers* invention^r. 'Tis true, he fitted it to *Chronological* uses; but whilst in the midst of his glorious attempts, behold him shaken by meek, and modest *Lydiat*, the happy *Inventor* of a more accurat *period*, whereby he so disturbed and confounded all his *supputations*, that (if we may believe the most Learned of the Age) he laid his *angry Rival* flat upon his back.

22. And so much concerning the *Lydiatean Period*, of which, because so much already in Print, I shall not add more, only in what *years* of as many of *them*, as have already been (which possibly may not be unacceptable to the *Reader*) the most considerable *Æra's* of the world have happen'd.

| <i>Years of the World.</i> | | <i>Years of the Lydiatean Periods.</i> | |
|---|-------|--|------|
| <i>The Flood.</i> | 1657. | 473. | (3) |
| <i>Birth of Isaac.</i> | 2109. | 333. | (4) |
| <i>Exodus.</i> | 2509. | 141. | (5) |
| <i>The Temple.</i> | 2988. | 28. | (6) |
| <i>Empire of Nebuchadn.</i> | 3401. | 441. | (6) |
| <i>Empire of Cyrus.</i> | 3471. | 511. | (6) |
| <i>Empire of Alexander</i> the Great. | 3675. | 123. | (7) |
| <i>Empire of Jul. Cæsar.</i> | | | |
| <i>Baptism of Christ.</i> | 4033. | 481. | (7) |
| <i>The Dionysian year of</i> our Lord, 1620. | 5624. | 296. | (10) |
| <i>The year of our Lord, 1676.</i> | | | |
| | 5680. | 352. | (10) |

° *Jul. Cæsar. Scal. Poetics, lib. 3. cap. 16.* ^r *Jos. Scalig. Epistol. lib. 3. Epist. 232.* ^q *Ibid. lib. 4. Epist. 446.* ^s *In Præfat. in Annales Jac. Vsserii, Archiep. Armachan.*

23. If I descend yet lower to *persons* now living, we shall daily find *Astronomy* receiving new *advancements*, particularly from the Right Reverend Father in God, *Seth* Lord Bishop of *Sarum*, one of the most cordial *Promoters* of this undertaking: who rather embracing the opinions of *Diogenes*, *Apollonius Myndius*, of the *Chaldees*, and at length of *Seneca*; That *Comets* are perpetual *stars*, and carryed about in a continued motion; than of *Kepler*, who thought them still produced *de Novo*, quickly perishing again; or of *Gassendus*, who held indeed they might be *corpora æterna*, but yet that they always moved in *straight lines*; he first proposed this new *Theory* of them, *viz.* that it was much more probable they might rather be carryed round in *Circles* or *Ellipses* (either including or excluding the *Globe* of the *earth*) so great, that the *Comets* are never visible to us, but when they come to the *Perige*'s of those *Circles* or *Ellipses*, and ever after invisible till they have absolved their *periods* in those vast *Orbs*, which by reason of their standing in an oblique, or perpendicular posture to the eye, he demonstrated might well seem to carry them in *straight lines*; all *circles* or *ellipses* so posited, projecting themselves naturally into such *lines*: which *Theory* was first proposed in a *Lecture* here at *Oxford*, and afterward set forth in the year 1653. The Right Reverend Father in God, *Seth* Lord Bishop of *Sarum*, and my very good *Lord*, being then *Professor* of *Astronomy* in this *University*.

24. In the same year, the same Right Reverend, and most accomplished *Bishop* first *Geometrically* demonstrated, the *Copernico-Elliptical Hypothesis* to be the most *genuine*, *simple* and *uniform*, the most easie and *intelligible*, answering all *Phænomena* without complication of motions, by *Excentrics*, *Epicycles*, or *Epicyc-Epicycles*. That the *Excentricities* of the *Planets* and their *Apoge*'s according to the *Ptolomaic hypothesis*, and the *Aphelions* according to the *Copernican*, might all be solved by a simple *Elliptical* line, was first indeed noted by *Kepler*, but how their *proper* and *primary Inequalities*, or *Anomalix Coæquatæ*, should thence be demonstrated *geometrically*, he profest he knew not, and utterly despaired it would ever be done: which stirred up the Learned *Ismael Bullialdus* to attempt the removal of this disgrace to *Astronomy*, which accordingly he thought he had done, finding the *method* of the *Aphelions*, and demonstrating (at least as he thought) the first *Inequalities*

lities geometrically, and making *Tables*; calling his work *Astronomiam Philolaicam*.

25. But how far he came short of what he pretended, was so plainly and modestly made appear by the Reverend *Bishop*, in a Book which he entituled, *Inquisitio in Ismaelis Bullialdi Astronomiae Philolaicae fundamenta*. Edit. Oxonii, 1653. that the ingenious *Bullialdus* himself, sent him a *Letter* of thanks, and recognition of his errors. Where also he further shews, that although *Bullialdus* had not, and *Kepler* thought no man could, rightly calculate the first *inequalities* according to the rules of *Geometry*, i. e. out of the known *middle motions* of the *Planets* (or true places of the *Aphelions*) accurately find *a priori*, their true or *appearing motions*: That yet there were *methods* by which it might be done, whereof he propounded *two* in the same *Book*, and demonstrated them, which afterwards applying to all the *primary Planets*, he set forth both *Elliptical* and *Circular Astronomy*, shewing how the *Phænomena*, according to both *Hypotheses*, might be geometrically made out, which he called his *Astronomia Geometrica*. Edit. Londini, An. 1656.

26. The *Elliptical Hypothesis* has received yet further advancement from Mr. *Edmund Halley* of *Queens College Oxon.* a young man, for his years of prodigious skill in *Astronomical* matters, who, amongst many other excellent performances in that *Science* to be met with in our *English Philosophical Transactions**, has shewed us a direct and geometrical method for finding the *Aphelions*, *Excentricities*, and *proportions* of the *Orbs* of the *primary Planets*, without supposing the equality of the angle of motion at the other *Focus* of the *Planets Ellipsis*, which has been hitherto always done amongst *Astronomers*: From whom I dare promise yet further improvements, he being lately gon to the *Isle* of *St. Helen*, for the more advantagious prosecution of his *Astronomical* studies; from whose *solitary observations* there, and *comparative ones* with Mr. *Flamsted's* here, *Astronomy* no question will receive considerable advancements.

27. To which may be added several other improvements this *Science* has received from that incomparable person Sir *Christopher Wren*, late *Professor* here: who before any thing of *Hugenius* appeared on that subject, from his constant observations of *Saturn*,

* *Philosoph. Transactions*, Numb. 116, 127, 128. * *Ibidem*. Numb. 128.

stated a *Theory* of that *Planet*; and of the *Moons Libration*. He has attempted also (and perhaps by this time performed) a *Selenography* by measure, what we have yet of that kind being rather *pictures*, than accurate *surveys* or *maps* of the *Moon*: To this purpose he contrived a *Lunar globe*, representing not only the *Mountains* and *Valleys* in solid work, but the several degrees of *whiteness* and *blackness* on the surface, which if turned to the light, shews all the *menstrual phases* of the *Moon*, with the several appearances that arise from the *shadows* of the *Hills* and *Vales*.

28. He has made *Maps* of the *Pleiades*, and other *Telescopical stars*, and proposed ways to solve the great *Question* concerning the *earths* rest or motion by some small *stars* about the *North pole*; to be seen only in large and well made *Telescopes*: To which *Instrument* he has added many sorts of *Rete's*, *screws*, and *Apertures*, to take in more or less *light*, by opening and shutting like the *pupil* of the *eye*, according as the *Observer* thinks fit; and has improved the *manufacture* of grinding good *glasses*. He has also made two *Telescopes* to open with a *joynt* after the manner of a *sector*, whereby *distances* may be taken to *half minutes*, and no differences found in the same *observation* often repeated, the *Instrument* not being lyable to any prejudice by warping or luxation. He has contrived and hung *Quadrants*, *Sextants*, and *Radii*, much better than heretofore, by which *Astronomical Observations* may be made more accurate and easie. Of all which ingenious and useful *Inventions*, there are much more full and *elegant relations*, in the most accurate *History* of the *Royal Society*^u: However, they being most, if not all of them found out *here*, or at least whilst their *Author* was *Astronomy Professor* in this *University*, I could not but mention them with relation to this place, as I shall some other matters which ow their *invention* to the same worthy person.

29. And these are all the *modern advancements* in *Astronomical* matters I can at present think of, onely a late *invention* of one *R. Holland*, a teacher of *Mathematicks* in this *City* for many years, who has shewed us a way to get the *Angle* of *Parallax* of a *Comet* or other *Phænomenon* at two *observations* to be taken in any one station or place of the *earth*, and thereby the distance from the *earth*: whereof no more, there being a short account of the whole *contrivance* set forth by *himself*, and printed at *Oxford*.

^u History of the Royal Society, Part. 2. sub finem.

30. Having done with the *Inventions* and *Improvements* that concern the *Heavens*, come we next to those belonging to the *sub-lunary World*, whereof the same Ingenious Sir *Christopher Wren* has furnish'd us with several ; as of exquisite subtilty, so of excellent use : Such as his contrivance to make *Diaries* of *wind* and *weather*, and of the various qualifications of the *air*, as to *heats*, *colds*, *drought*, *moisture*, and *weight*, through the whole *year* ; and this in order to the *History of Seasons* : with observation, which are the most healthful or contagious to *men* or *beasts* ; which, the Harbingers of *blights*, *meldews*, *sinut*, or any other accidents attending *men*, *cattle*, or *grain* ; so that at length being instructed in the *causes* of these *evils*, we may the easier *prevent*, or find *remedies* for them.

31. Now that a constant observation of these qualities of the *air*, both by night and day might not be insuperable ; he contrived a *Thermometer* to be its own *Register*, and a *Clock* to be annexed to a *weather-cock*, which moves a *Rundle* covered with white Paper ; upon which the *Clock* moving a black-lead *penfil*, the *observer*, by the traces of the *penfil* on the paper, may certainly know what *winds* have blown, during his sleep or absence, for 12 hours together. He has also discover'd many subtile ways for easier finding the degrees of *drought*, and *moisture*, and the gravity of the *Atmosphere* ; and amongst other Instruments, has *Balances* (also useful for other purposes) that shew the pressure of the *air*, by their easie (I had almost said spontaneous) inclinations^w.

32. He has made Instruments whereby he has shewn the Mechanical reason of *sailing* to all *winds* ; and others of *Respiration*, for straining the *breath* from thick vapors, in order to tryal whether the same *breath* thus purified will serve turn again. Which *Experiments*, however nice they may seem, yet being concerned about a subject so nearly related to *man*, that he always lives in it, and cannot long without it, and is well or ill according to its alterations, the minutest discoveries of its *nature* or *qualifications* ought to be valuable to us.

33. Wherein yet we have been assisted by nothing more, than the *Pneumatick Engine*, invented here at *Oxon*: by that miracle of Ingenuity, the Honorable *Robert Boyle* Esq; with the concurrent

^w *Ibidem*.

help of that exquisite contriver, Mr. *Robert Hook*, commonly called the *Air Pump*; so different a thing from the *Instrumentum Magdeburgicum*, devised by *Otto Gericke*^x, an ingenious Consul of that *Republick*, that it can scarce be reckoned an improvement of *that*, but a new *Engine*; although it must not be denied but the *Magdeburg Experiment* gave occasion to its *Invention*. By the assistance whereof, that *Noble Philosopher* hath accurately examined the *Elastical power, pressure, and weight*; *expansion and weakness* thereupon, of this *element*; and thereby found out so many things *new*, relating to the height and gravity of the *Atmosphere*, nature of a *Vacuum*; *Flame*, and *Excandescence of coals, match*, firing of *gun-powder*; propagation of *sounds, fluidity, light, freezing, respiration, &c.* that to give an account of them all according to the merits of the *Experiments*, would be to transcribe the whole *Treatise* of that *Honorable Author* set forth on this subject; whither I refer the *Reader* for further satisfaction, and so to the rest of his *Works* upon several other subjects; many of his numerous *inventions and improvements*, wherewith he has so highly obliged the World, having been made in this place.

34. Whereof I shall mention no more (it being indeed uncertain as to most of them, which were made here, which at *London*, and which at other *places*) only the *Barometer*, a well known Instrument, also invented here by the same *Noble Person*, whereby, the gravity of the *Atmosphere* has been daily observed by the Reverend and Learned Dr. *John Wallis*, for about six years together: in all which time he found the *Quick-silver* in the *Tube*, never to ascend much above 30 inches, and never to descend much below 28, which he takes to be the whole *latitude* of its *variation*. He also observed, for most of that time, the temper of the *air* by a *Thermometer*, whereof he has still the Notes by him, which are very particular for every day.

35. Which latter *instrument*, though of very ancient *invention*, there having been one of them found by *Robert de Fluctibus* graphically delineated, in a MS. of 500 years antiquity at least: yet it has still received other useful *advancements* (beside that above mention'd) from that curious Artist Sir *Christopher Wren*, who finding the usual *Thermometers* not to give so exact a measure of the *airs* extension, by reason the gravity of the *liquor* as it

^x *Gasp. Schotti Magiæ Univer. part. 3. lib. 7. cap. 6.* † *Mosaical Philosophy; lib. 1. cap. 2.*

stands higher or lower in the Glass, weighs unequally on the *air*, and gives it a contraction and extension, beside what is produced by *heat* and *cold*; he therefore invented a *Circular Thermometer*, in which the *liquor* can occasion no such fallacy, it remaining continually of one *height*, and moving the whole *instrument* like a wheel on its axel ².

36. Amongst other *Aerotechnicks*, here is a Clock lately contrived by the ingenious *John Jones* LL. B. and Fellow of *Jesus College Oxon*: which moves by the *air*, equally expressed out of *bellows* of a *cylindrical* form, falling into folds in its descent, much after the manner of *Paper Lanterns*: These, in place of drawing up the weights of other *Clocks*, are only filled with *air*, admitted into them at a large orifice at the top, which is stop'd up again as soon as they are full with a hollow *screw*, in the head whereof there is set a small *brassplate*, about the bigness of a silver half penny, with a hole perforated scarce so big as the smallest pins head: through this little hole the *air* is equally expressed by *weights* laid on the top of the *bellows*, which descending very slowly, draw a *Clock-line*, having a counterpoise at the other end, that turns a pulley-wheel, fastened to the *arbor* or *axis* of the *hand* that points to the *hour*: which device, though not brought to the intended perfection of the Inventor, that perhaps it may be by the help of a *tumbrel* or *fusie*, yet highly deserves mentioning, there being nothing of this nature that I can find amongst the writers of *Mechanicks*.

37. To which may be added, a hopeful *improvement* of that uncommon *Hygroscope*, made of two *Deal*, or rather *Poplar boards*, mention'd in our English *Philosophical Transactions* ^a, contrived by my ingenious Friend *John Young* M. A. of *Magdalen Hall*, who rationally concluding, that the *teeth* of the thin piece of *brass* placed across the juncture of the two *boards*, must needs in its passage from bearing on one side of the *teeth* of the *pinion*, to the other, upon change of weather, make a stand as it were in respect of the motion of the *axel* of the *hand*; thinks a pretty stiff *spring* cut on the under side, after the manner of a fine *file*, placed flat and not edge-ways, and bearing pretty hard upon an *axel* of *Copper*, may turn the hand upon change of *weather* in the *punctum* of reversion, without any more than a negative rest: which be-

² History of the Royal Society, part. 2. sub finem. ^a Philosoph. Transact. Numb. 127.

ing an opinion so very rational and unlikely to fail, when brought to the test, I thought fit to propound it to the *Ingenious*, though the *Press* would not give us leave first to experiment it our selves: Whence I proceed,

38. To such *Arts* as relate to the *Fire*, which I have placed next, in regard we have knowledge of no other but what is *Culinary*; that in the *concave* of the *Moon* being only a *dream* of the *Ancients*. Amongst which, we must not forget the perpetual, at least long-lived *Lamps*, invented by the Right Worshipful Sir *Christopher Wren*; nor his *Registers* of *Chymical Furnaces* for keeping a constant heat in order to divers uses; such as imitation of Nature in the production of *Fossiles*, *Plants*, *Insects*; hatching of *Eggs*, keeping the motions of *Watches* equal, in reference to *Longitudes* and *Astronomical* uses, and several other advantages^b.

39. But amongst all the *Fire-works* ever yet produced by the Art of Man, there is none so wonderful as that of *Frier Bacon*, mention'd in his *Epistle ad Parisiensem*, where speaking of the secret works of *Nature* and *Arts*, he has these words, *In omnem distantiam quam volumus possumus artificialiter componere ignem, comburentem ex sale Petreæ, & aliis^c*; which *alia*, as the Reverend and Learned Dr. *John Wallis* saw it in a MS. Copy of the same *Roger Bacon*, in the hands of the Learned Dr. *Ger. Langbain*, late Provost of *Queens College*, were *Sulphur*, and *Carbonum pulvis*: concerning which, after a while he further adds: *Præter hæc (i. e. combustionem) sunt alia stupenda naturæ, nam soni velut Tonitrus, & coruscationes possunt fieri in aere, imo majore horrore, quam illa quæ fiunt per naturam: Nam modica materia adapta, sc. ad quantitatem unius pollicis, sonum facit horribilem & coruscationem ostendit violentem, & hoc fit multis modis quibus Civitas aut Exercitus destruat. --- Igne exsiliante cum fragore inæstimabili--- Mira hæc sunt si quis sciret uti ad plenum in debitâ quantitate & materiâ.*

40. That is, that of *Salt-peter*, and other matters, viz. *Sulphur*, and the *dust of coal*, he could make *fire* that should burn at what distance he pleased; and further, that with the same matter he could make sounds like *Thunder*, and coruscations in the *air* more dreadful than those made by *Nature*: For, says he, a little of this matter rightly fitted, though not bigger than ones *Thumb*, makes a horrible noise, and shews a violent coruscation,

^b History of the Royal Society, Part. 2. sub finem. ^c In Epist. ad Parisiensem. cap. 6.

which may be ordered many ways; whereby a *City* or *Army* may be destroyed---the *Fire* breaking forth with an unspeakable noise ---which are wonderful things, if a *man* knew exactly how to use them in due quantity and matter.

41. Whence 'tis plain, he either *invented* or knew *Gun-powder*, though I think we cannot allow him less than the first, till we find out an ancients *Author* for it*, which if no body ever do's (as 'tis manifold odds they never will) in all probability it was *invented* hereat *Oxford*, where he made the rest of his affrightening *Experiments*. And that out of his works, *Constantinus Ancklitzen* of *Friburg*^d, or *Bertboldus Swartz*^e, and the rest of the *Improvers*, in all likelihood might have their pretended *Inventions*, though we allow him not quite so *explicit* as in the *Copy* of the Reverend and Learned Dr. *Langbain*, but that as 'tis conjectured by Dr. *Dee*^f, he somewhat concealed his *Invention* in the word [*aliis*] well knowing it might be dangerously destructive to *man-kind*.

42. As for *Water-works* invented or improved in this *County*, some concern profit, and others only pleasure. Of the first sort, is an Instrument of Sir *Christopher Wrens*, that measures the quantity of *Rain* that falls, which as soon as 'tis full, empties it self, so that at the years end 'tis easie to compute how much has fallen on such a quantity of *ground* for all that time; and this he contrived in order to the discovery of the *Theory* of *Springs*, *exhalations*, &c. And secondly, other Instruments whereby he has shewn the *Geometrical Mechanic* of *Rowing*, viz. that the *Oar* moves upon its *Thowle*, as a *vectis* on a yielding *fulcrum*, and found out what degree of *impediment* the *expansion* of a body to be moved in a liquid *medium* ordinarily produces in all proportions, with several other matters in order for laying down the *Geometry* of *sailing*, *swimming*, *rowing*, and the *fabrick* of *Ships*^g.

43. Hither also belong the *Locks* and *Turn-pikes* made upon the River *Isis*, the 21 of King *James*, when it was made navigable from *Oxford* to *Bercot*, which are absolutely necessary for that purpose, on shallow *rivers* that have also great *falls*, to keep up the *water*, and give the *vessels* an easie descent. For the first where-

* *Baconus fatis concessit, Anno 1292* near 100 years before any of the other pretended *Inventions*.
^d *Vid. Guid. Paucirolli rer. memorab. recens Invent. part. 2. tit. 18.* ^e *Vid. Steph. Forcatulum I. C. de Gallorum Imperio & Philosoph. lib. 4. sub finem.* ^f *Dr. Dees Annotations in Epist. ad Parisiensem.* ^g *History of the Royal Society, Part. 2. sub finem.*

of, provided the fall of water be not great, a *Lock* will suffice, which is made up only of bars of wood called *Rimers*, set perpendicularly to the bottom of the passage (which are more or less according to its breadth) and *Lock-gates* put down between every two of them, or boards put athwart them, which will keep a head of water as well as the *Turn-pike* for the passage of a *Barge*, but must be all pulled up at its arrival, and the water let go till there is an abatement of the fall, before the *boat* may pass either down or upwards; which, with the stream, is not without violent precipitation; and against it, at many places, not without the help of a *Capstain* at Land; and sometimes neither of them without imminent danger.

44. But where the declivity of the *Channel*, and fall of water is so great, that few *barges* could live in the passage of them, there we have *Turn-pikes*, whereof there are three between *Oxford* and *Bercot*; one at *Ifley*, another at *Sanford*, and a third at *Culham* in the *Swift-ditch*, which was cut at that time when the *River* was made navigable; and are all thus contrived. First, there are placed a great pair of *Folding doors*, or *Flood-gates* of *Timber* cross the *river*, that open against the stream and shut with it, not so as to come even in a straight line, but in an *obtuse angle*, the better to resist and bear the weight of the *water*, which by how much the greater it is, by so much the closer are the *gates* pressed; in each of which *Flood-gates* there is a *sluce* to let the water through at pleasure, without opening the *gates* themselves. Within these, there is a large square taken out of the *river*, built up at each side with *Free-stone*, big enough to receive the largest *barge* afloat; and at the other end another pair of *Flood-gates*, opening, and shutting, and having *sluces* like the former. Which is the whole *Fabrick* of a *Turn-pike*.

45. At the uppermost pair of these *gates* the water is stopt, which raises it in the *river* above, and gives the *Vessels* passage over the *shallows*, which when come to the *Turn-pikes*, the *Sluces* are first opened, and the water let in to the *square* or inclosed space between the two pair of *gates*, where it must necessarily rise (the lower *gates* being shut) till at length it comes to be level with the surface of the *river* above: when this is done, the upper stream then making no such pressure on the *gates* as before, they are easily opened by two or three *men*, and the *Vessels* let in

one at a time ; which done, they shut those upper *gates* and *sluces* as before : Then they open the *sluces* of the *gates* at the other end of the *Turn-pike*, and let the *water* by degrees out of the *inclosed square* till it is sunk down, and the *Vessel* with it, level with the *river* below, and then open the *gates* themselves, and let the *Vessel* out ; the upper *gates* all the while being drove too, and kept so fast by the *water* above, that little of it can follow. And thus the *boats* go down stream.

46. But when they return, they are first let into the *inclosed space* (where the *water* stands constantly level with that of the lower *channel*) at the lower *gates*, which as soon as shut again, the *sluces* are opened at the uppermost *gates*, and the *water* let in, till it rises with the *boat* upon it, to be equal with that of the *river* above : this done, the upper *gates* are easily opened as before, there being no pressure upon them, and the *boat* let out. So that notwithstanding the *Channel* has much steeper *descents* where these *Turn-pikes* are set, than at any of the *Locks*, yet the *boats* pass at these with much more ease and safety. Notwithstanding these provisions, the River *Thames* is not made so perfectly *Navigable* to *Oxford*, but that in dry times, *barges* do sometimes lie aground three weeks, or a month, or more, as we have had sad experience this last *Summer* ; which in great measure no doubt might be prevented, were there a convenient number of *Locks*, or *Holds* for *water*, made in the River *Cherwell* above *Oxford*, to let down *flashes* as occasion should serve ; and so again out of the River *Kennet* near *Reading*, the *Lodden*, &c.

47. Not impertinent hereunto is a contrivance for *Fish-ponds*, that I met with at the Right Worshipful Sir *Philip Harcourt's* at *Stanton Harcourt*, where the *stews* not only feed one another, as the *Ponds* of the Right Honorable the Earl of *Clarendon* at *Cornbury*, Sir *Timothy Tyrrels* at *Shot-over-Forrest*, and the worshipful *Brome Whorwoods* at *Holton*, &c. and may be *sewed* by letting the *water* of the upper *Ponds* out into the lower ; but by a *side Ditch* cut along by them, and *Sluces* out of each, may be any of them emptied, without letting the *water* into, or giving the least disturbance to any of the rest : which being a convenience that I never met with before, and perhaps unknown to many, I thought good to mention.

48. Amongst

48. Amongst the *Water-works* of Pleasure, we must not forget an *Engine* contrived by the Right Reverend Father in God, *John Wilkins*, late Lord Bishop of *Chester*, when he was *Warden* of *Wadham College*, though long since taken thence; whereby, of but few gallons of *water* forced through a narrow *Fissure*, he could raise a *mist* in his *Garden*, wherein a person placed at a due distance between the *Sun* and the *mist*, might see an exquisite *Rain-bow* in all its proper *colours*: which distance I conceive was the same with that assigned by *Des Cartes*, viz. where the Eye of the *Beholder* is placed in an angle of 42 degrees, made by the *decussation* of the line of *Vision*, and the rays of the *Sun*; and the *Fissure* such another as in his *Diagram*^h. But what kind of *Instrument* it was that forced the *water*, I dare not venture to relate, the description given me of it being but lame and imperfect.

49. Nor can I pass by unmentioned, a *Clock* that I met with at *Hanwell*, at the House of the Right worshipful Sir *Anthony Cope*, that moves by *water*, and shews the *hours*, by the rise of a new gilded *Sun* for every *hour*, moving in a small *Hemisphere* of wood, each carrying in their *Centers* the number of some *hour* depicted *black*; as suppose of *one* a clock, which ascending half way to the *Zenith* of the *arch*, shews it a quarter past *one*, at the *Zenith* half *hour*; whence descending again half way towards the *Horizon*, three quarters past *one*; and at last absconding under it, there presently arises another gilded *Sun* above the *Horizon* at the other side of the *arch*, carrying in its *center* the figure *two*: and so of the rest. Which ingenious device, though taken out of *Bettinus*ⁱ, who calls it, *aquarii Automatis ingeniosissimi horariam operationem*: yet being since improved by that ingenious Person, and applied to other uses, particularly of a *Pseudo-perpetual motion* made by the descent of several gilt *bullets* upon an indented declivity, successively delivered by a wheel much of the same fabric with the *Tympanum* of the *Water-clock*, so that they seem still the same: I could not but in justice take notice of it.

50. There are some other *Water-works* at the same Sir *Anthony Copes*, in a House of *diversion* built in a small *Island* in one of the *Fish-ponds*, Eastward of his house, where a *ball* is tost by a *column* of *water*, and artificial *showers* descend at pleasure; within which they can yet so place a *candle*, that though one would think it must

^h *Des Cartes Meteoror. cap. 8.* ⁱ *Marii Bettini Ærarii Philosoph. Mathemat. Tom. 2. Exodio §. 6. ult.*

needs be overwhelmed with *water*, it shall not be extinguish't, &c. But the *Water-works* that surpass all others of the *County*, are those of *Enston*, at the *Rock* first discovered by *Tho. Busbell* Esq; about 4 or 5 and forty years since, who cleansing the Spring then called *Goldwell*, though quite over-grown with bryars and bushes, to place a *Cistern* for his own drinking, met with a *Rock* so wonderfully contrived by *Nature* her self, that he thought it worthy of all imaginable advancement by *Art*.

51. Whereupon he made *Cisterns*, and laid divers *Pipes* between the *Rocks*, and built a house over them, containing one fair room for *banqueting*, and several other small *Closets* for divers uses, beside the rooms above; which when finish't in the year 1636. together with the *Rock*, *Grove*, *Walks*, and all other the appurtenances, were all on the 23^d of *August*, by the said *Tho. Busbell* Esq; presented to the then *Queens* most excellent *Majesty*, who in company with the *King* himself, was graciously pleased to honor the *Rock* not only with her *Royal* Presence, but commanded the same to be called after her own *Princely* Name, *HENRIETTA*: At which time as they were entring it, there arose a *Hermite* out of the ground, and entertain'd them with a *Speech*; returning again in the close down to his peaceful *Urn*. Then was the *Rock* presented in a *Song* answer'd by an *Echo*, and after that a *banquet* presented also in a *Sonnet*, within the *Pillar* of the *Table*; with some other *Songs*, all set by *Symon Iwe*.

52. Which *structure*, with all the *Ingenious* Contrivances about it, continued in a flourishing condition for some few years, till the late unhappy *Wars* coming on, it became wholly neglected, and so sensibly decayed, till at last it lapsed (being next door to ruine) into the Hands of the Right *Honorable* and truly *Noble* Lord, *Edward Henry* Earl of *Lichfield*, Lord of the *soil*; who in the year 1674. not only repaired the broken *Cisterns* and *Pipes*, but made a fair addition to it, in a small *Island* situate in the passage of a *Rivulet*, just before the building set over the *Rock*; which though the last in erection, is yet the first thing that presents it self in the exterior *Prospect* of the whole work, *Tab. 11.* wherein the *Figures*,

1. 1. *Shew the water of the Rivulet.*

2. 2. *The Island in the middle of it,*

3. 3. *the*

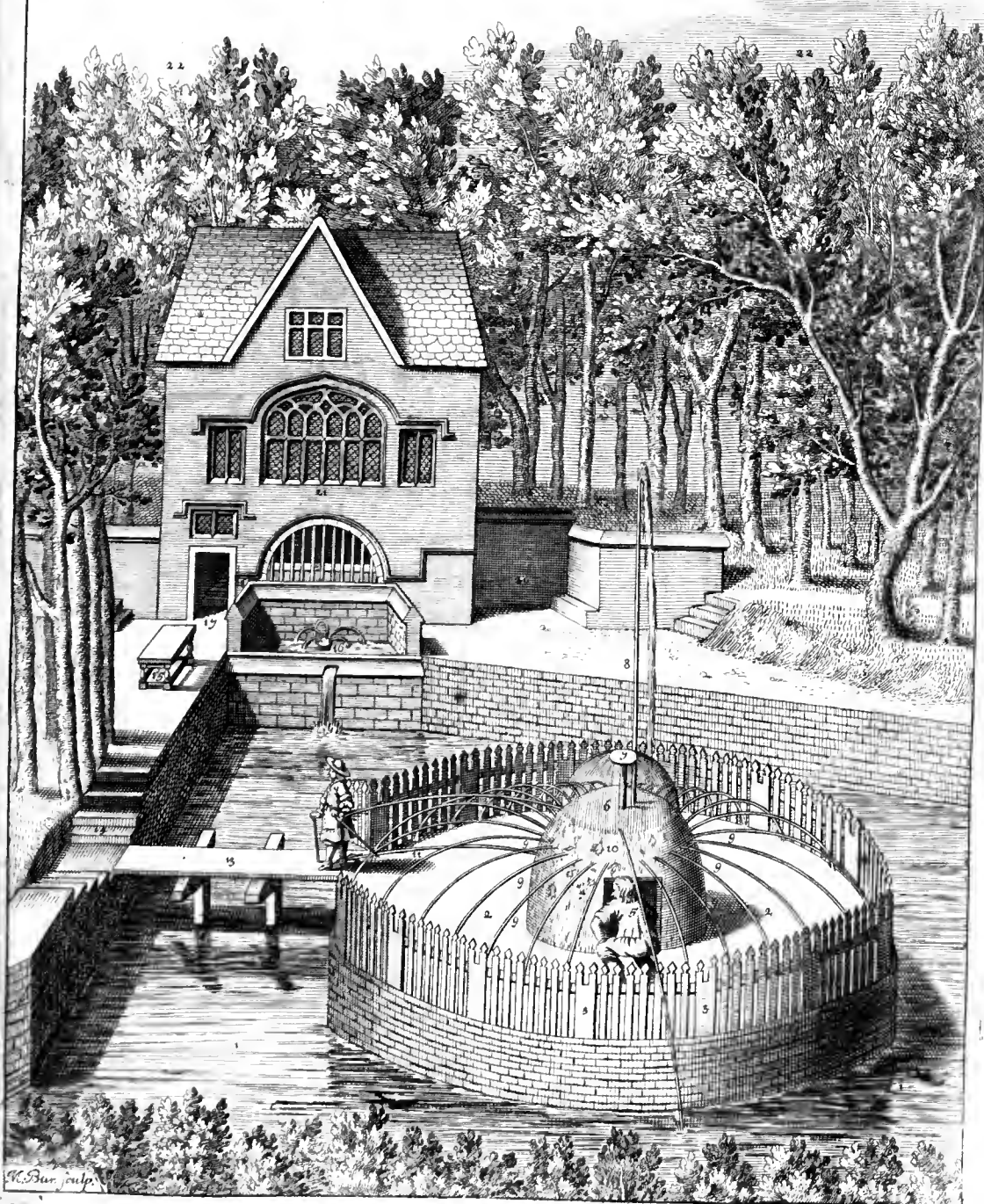
3. 3. *the Pales round it standing on a stone wall.*
4. *An artificial Rock erected in the middle of the Island, covered with living aqueous Plants.*
5. *The Keeper of the Water-works that turns the Cocks.*
6. *A Canopy of water cast over the Rock, by*
7. *an Instrument of Brass for that purpose.*
8. *A Column of water rising about 14 foot, designed to toss a Ball.*
999999. *The streams of water from about 30 Pipes set round the Rock, that water the whole Island, and sportively wet any persons within it; which most people striving to avoid, get behind the Man that turns the Cocks, whom he wets with*
10. *a spout of water that he lets fly over his head; or else if they endeavor to run out of the Island over the bridge, with*
11. 12. *which are two other Spouts, whereof that represented at a 11, strikes the legs, and that at 12 the reins of the back.*
13. *The Bridge over the water lying on two trestles.*
14. *The steps leading into the Grove, and toward the House, where you pass by*
15. *a Table of black Marble.*
16. *A Cistern of stone, with five spouts of water issuing out of a ball of brass, in which a small Spaniel hunts a Duck, both diving after one another, and having their motion from the water.*
17. *The way up into the banquetting-room over the Rock, and other Closets, &c.*
18. *The passage between the Cistern and Building.*
19. *The iron grate that gives light to the Grot within.*
20. *The passage down to the Grot.*
21. *The windows of the Banqueting-room.*
22. *The Grove and Walks behind and on each end of the Building.*

53. Being now come down into the Grot by the passage 18, Tab. 11. and landing at the bottom of the stairs, Tab. 12. a. on a large half pace before it bb. The Rock presents it self made up of large craggy stones with great cavities between them, ccc &c. out of which flows water perpetually night and day, dashing against the Rocks below, and that in great plenty in the dryest Seasons, though

though fed only with a single *spring* rising in a piece of ground call'd *Ramsfall*, between *Enston* and *Ludston*. The natural *Rock* is about 10 foot high, and so many in bredth ; some few *shelves* of lead *dd*, and the top stones only having been added (easily to be distinguisht by their *dryness*) which have advanced it in all about 14 foot high.

54. In the *half pace* just before the *Compartment e e e*, upon turning one of the *cocks* at *f* rises a *chequer hedge* of *water*, as they call it, *g g g g* ; and upon turning *another*, the two side *columns* of *water b b*, which rise not above the height of the natural *rock* ; and of a *third*, the middle *column i*, which ascending into the *turn* of the *Arch*, and returning not again, is received into hidden *pipes* provided for that purpose : Into *one* whereof, terminated in a very small *Cistern* of *water* behind a *stone* of the *rock*, and having a *mouth* and *Languet* just above its surface, the *air* being forced into it by the approaches of the *water*, a noise is made near resembling the *notes* of a *Nightingale* : But when that *pipe* is filled there is then no more singing, till the *water* has past away by another *pipe* in the lower part of the *rock*, which when almost done, there is heard a *noise* somewhat like the sound of a *drum*, performed by the rushing in of *air* into the hollow of the *pipe*, which is large, and of *copper*, to supply the place of the *water* now almost gon out ; which don, the *Nightingale* may be made to sing again.

55. From the turned *roof* of the *rock*, by help of the brass *instrument k*, and turn of a cock in one of the *closets* above, they can let down a *canopy* of *water ll* ; from the top also they can throw *arched spouts* of *water* crossing one another, and dashing against the walls, opposite to those of their rise, as at *m n* and *op* ; and *others* that rise out, and enter in again to the *roof* at some distance, never falling down at all at *q r* and *s t*. Which falls of *water* may be also delicatly seen, turning the back upon them as well as looking forward, by help of a Looking-glass placed in the wall opposite to them, which could not be possibly represented in the *Cut*. And some of these *waters* (I must not say which) being often used by way of *sport* to wet the *Visitants* of the *Grot*, that they might not avoid it by running up the *stairs*, and so out into the *Grove*, by turning a cock in another of the *Closets*, they can let fall water so plentifully in the *door u u*, that most people rather



ther chuse to stay where they are, than pass through it : which is all concerning the inner *Prospect* of the Rock ; what remains being only a representation of the *Arch* of stone *ww* built over it, with two *Niches* *x y* one of each side, and the *grate* *z* at the top, through which they look down out of the *Banqueting-room* into the *Grot*. Of which no more, but that behind the Rock there is a *Cellar* for keeping *Liquors* cool, or placing *Musick*, to surprise the *Auditors* ; and behind that the *Receivers* of *water* to supply the *Pipes*, &c.

56. To these succeed the *Arts* relating to *Earths*, which either respect the *Tillage*, or *Formation* of them. How many sorts of *Soils* I met with in *Oxfordshire*, viz. *Clay*, *Chalk*, and others from their different *mixtures* called *Maum*, *Red-land*, *Sour-ground*, *Stone-brash*, *Stony*, *Sandy*, and *Gravelly*, were enumerated amongst *Earths*, Chap. 3. It remains that we here give a particular account, by what *Arts* they are tilled to the best advantage. And first of *Clay*,

57, Which is kind for *Wheat*, as most of it is, hath its first *tillage* about the beginning of *May* ; or as soon as *Barly* Season is over, and is called the *Fallow*, which they sometimes make by a *casting tilth*, i. e. beginning at the out sides of the *Lands*, and laying the *Earths* from the *ridge* at the top. After this, some short time before the second *tilth*, which they call *stirring*, which is usually performed about the latter end of *June*, or beginning of *July*, they give this Land its *manure* ; which if *Horse-dung* or *Sheeps-dung*, or any other from the *Home-stall*, or from the *Mixen* in the Field, is brought and spread on the *Land* just before this *second* ploughing : But if it be *folded* (which is an excellent *manure* for this *Land*, and seldom fails sending a *Crop* accordingly if the *Land* be in *tillage*) they do it either in *Winter* before the *fallow*, or in *Summer* after it is *fallowed*. And these are the *manures* of *Clay* Land in the greatest part of *Oxfordshire*, only in and near the *Chiltern* ; where beside these, it is much enriched by a soft mellow *Chalk* that they dig from underneath it : when it is *stirred* it lies again till the time of sowing *Wheat*, except in a moist dripping year, when runing to *thistles* and other *weeds*, they sometimes give it a second *stirring*, before the *last* for sowing.

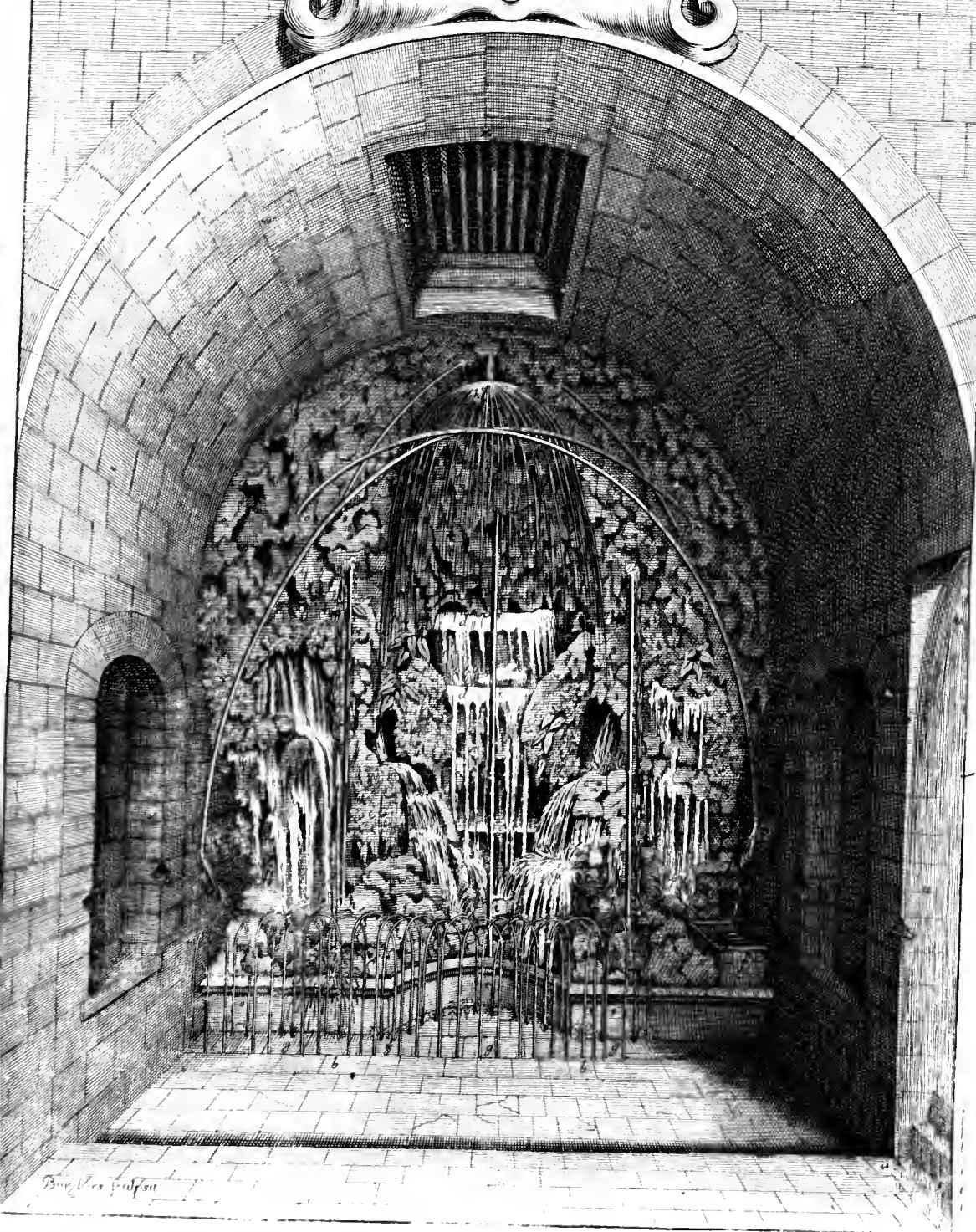
58. All which *tillages* they are very careful to give it as dry as may be, *ridging* it up twice or thrice for every *casting tilth* (i. e. in their *stirring*, and for *sowing*, beginning at the top of the *Land* and

and laying the *Earth* still upwards to the *ridge*) by which means both *Land* and *Corn* lie dryer, warmer, and healthier, and the succeeding *Crop* becomes more free from *weeds*. After it is thus prepared, they sow it with *Wheat*, which is its proper *grain*; and if it be a strong stiff *Clay*, with that they call *Cone-wheat*: and the next year after (it being accounted advantagious in all *tillage* to change the *grain*) with *Beans*; and then ploughing in the *bean-brush* at *All-Saints*, the next year with *Barly*; and amongst the several sorts of that *grain*, if the *Land* be rank, with that they call *sprat-Barly*; and then the fourth year it lies *fallow*, when they give it *Summer tilth* again, and sow it with *Winter Corn* as before. But at most places where their *Land* is cast into three *Fields*, it lies *fallow* in course every *third* year, and is sown but *two*: the first with *Wheat*, if the *Land* be good, but if mean with *Miscellan*, and the other with *Barly* and *Pulse* promiscuously. And at some places where it lies out of their *hitching*, *i. e.* their *Land* for *Pulse*, they sow it but every second year, and there usually two Crops *Wheat*, and the third *Barly*, always being careful to lay it up by *ridging* against *winter*; *Clay* Lands requiring to be kept high, and to lie warm and dry, still allowing for *Wheat* and *Barly* three *plowings*, and sometimes four, but for other *grains* seldom more than *one*. When at any time they sow *Peas* on this *Land*, the best Husbandmen will chuse the *Vale-gray* as most proper for it; and if *Veiches*, the *Gore* or *Pebble-vetch*: But if so cold a *weeping Clay* that unfit for these, then they improve it with *Ray-grass*.

59. As for the *Chalk-lands* of the *Chiltern-hills*, though it requires not to be laid in *ridges* in respect of *dryness*, yet of *warmth* it doth: when designed for *Wheat*, which is but seldom, they give it the same *tillage* with *Clay*, only laying it in *four* or *six* furrow'd *Lands*, and *soiling* it with the best *mould*, or *dung* but half rotten, to keep it from *binding*, which are its most proper *manures*; and so for *common Barly* and *winter Veiches*, with which it is much more frequently sown, these being found the more suitable *grains*. But if it be of that poorest sort they call *white-land*, nothing is so proper as *ray-grass* mixt with *Non-such*, or *Melilot Trefoil*, according as prescribed in *Chap. 6. §. 33*.

60. If the *Land* be of that sort they call *Maumy*, consisting of a mixture of *White-clay* and *Chalk*, and somewhat of *Sand*, which causes it to work so short if any thing dry, it is commonly sown with

To the most Illustrious Lady, the Lady
ANNE
 Countess of Lichfield Viscountess Quarrendon &
 Baroness of Spelsbury &c.
 This 12. Table
 Shewing the interior Prospect of *St. Anne's*
 works, with the greatest devotion is humbly Unveiled
 by R. P. L. D.



with all sorts of *Wheat*, *Miscellan*, *Barly*, &c. having the same *tillage*, and requiring to be kept high, and to lie dry and warm as the *Clay* doth, only its most proper *manure* is the rottenest dung; and as they sow *Beans* next after *Wheat* in *clay* grounds, in this they judge *Peas* a more agreeable *grain*, and take care in their *seed-time* that the weather be fair, and settled; for if there happen but a smart shower presently after they have sown, it will bind so fast, that the *seed* in great part will be utterly lost; whereas if they have but one or two dry nights, all succeeds well enough.

61. If *Red-land*, whereof there are some quantities in the *North* and *West* of *Oxford-shire*, it must have its *tillage* as soon in the year as possibly may be, before the *clay*, where they are in competition, because it will not endure the scorching *tillage* that *clay* will do, and therefore must have it before the *Sun* get to near the *Crab*: if it be moist when *fallowed*, so it be not too wet, it is the better. This never requires a double *stirring*, nor must be made too *fine* and *light*, for then it runs to *May-weed*, or *Mathern*, as they call it; yet the *manure* for *clay* does very well with it, but the mixt *manure* of *Horse-dung* and *Cow-dung* together, they say does best of any: Nor is the *Sheep-fold* amiss either *Winter* or *Summer*, which must all be applied before *stirring*, and ploughed in; if for *wheat*, about the latter end of *July*, or beginning of *August*; if for *barly*, later in the year, as the time and season gives leave. This Land, like *clay*, bears *wheat*, *miscellan*, *barly*, and *peas*, in their order very well, and lies *fallow* every other year, where it falls out of their *hitching*.

62. There is another sort of ground in this *County* which they call *Sour-land*, which must have its *tillth* according to its state and condition when they set about it; if it have a strong *swarth* on it, then they cast to give it a *fallow*, when the *Sun* is pretty well enter'd *Cancer*; and this they call a *scalding-fallow*, which kills the *grafs* roots, and makes the *Land* fine: But if it be *light*, and as they term it, hath *little skin on the back*, they either leave it for cooler *tillage*, or plough it early in the year as soon as their *clay* is *fallowed*, and then there will spring some *spring-grafs* that will keep it from scorching in the *Summer*; for if they suffer it to be *scorched* when it is *light* before, all their *Art* and *Manure* will never procure a good *Crop* of it.

63. The *Sheep-fold* is good for this Land *winter* and *summer*, they *manure* it also with the Dung-cart, if near home, before the *stirring*; but *Pidgeons* dung is the most proper for this sort of soil, because it is for the most part very *cold Land*, and so is *Mault-dust* in a larger quantity, both sown with the *winter-corn* and ploughed in with it, for then it lies warm at the roots of the *Corn* all *winter*, and corrects the *crudities* of the *rains* and *frosts*, makes the *Corn* cover the ground sooner than ordinary, and holds the moisture of the *Spring* longer with it; and in short (if thus ordered) brings a certain *Crop*. It must not be stirred or sown very wet, for then it proves uneasy both for *Man* and *Beast*, nor will it be kind for *Corn*, it being then very hard to cover it with the *barrows*. It is a good *Land* for *wheat* or *miscellan*, when it is fine, especially if in condition for a *scalding fallow*, and accordingly is sown with that and *barly* by turns to change the *grain*; and when it falls in a *Peas* quarter, seldom fails of a good *burthen*, though sometimes it doth not *kid* very well, which yet possibly may be prevented by sowing the *Gosswold Pea*, which I guess the most agreeable to this sort of *ground*: But if too wet for these, the *rath-ripe Vetch* is fittest for it.

64. In some parts of the *County* they have another sort of *Land* they call *Stone-brass*, consisting of a light lean *Earth* and a small *Rubble-stone*, or else of *that* and *sour ground* mixt together, which are also tilled according to their present condition; for if they be *grasse*, which they otherwise call *swardy*, they *fallow* them pretty late, but not so *hot* and *scorching* as *sour ground*, because they will not bear such *tillage*: But if they be *scary*, as they word it, *i. e.* have no *skin* or *sward* upon them, they either fold them in *winter*, and the *sheeps dung* with addition of some *hay seeds*, will help them to get *grasse*; or else they lay upon them in the beginning of the *spring*, old *thatch* or *straw*, or the most *strawy* part of the *dung-hill*, *earth* out of *ditches*, the *shovelings* of a dirty *Court*, or the like, which spread thin will assist the *grass* in its growth; which must necessarily be had, for they hold it (in some parts of the *County* at least) for a general Rule, that if these sorts of *Land* have not *sward* on them before they are *fallowed*, they will by no means bring a kind *Crop*, but great store of *Mony-wort*, *May-weed*, &c.

65. This done in *September*, *October*, *November*, and sometimes in

in *December*, they *fallow* them as their *swards* direct, and if in either of the two last *months*, are called *Winter-fallows*, and are never stirred at all, but sowed with *Barly* upon the second *earth* in the beginning of *sowing*, because then they work most kindly, and will bear cold weather better than when more finely *tilled*. These *Lands* will also bear *Wheat* and *Miscellan* indifferently well in a kind year, but not so well as *clay*, *four-ground*, or *red-land*; but they bear a fine round *barly* and thin skin'd, especially if they be kept in *heart*: They lie every other year *fallow* (as other *Lands*) except where they fall among the *Peas* quarter, and there after *Peas* they are sown with *Barly*, and lie but once in four years. These are sown also many times with *Dills* or *Lentils*, and when quite worn out, or so poor that they will bear nothing else to advantage, they are yet fit for *Ray-grass* mixt with *Trefoil*, as prescribed above in the Chapter of *Plants*.

66. There is a sort of *tillage* they sometimes use on these *Lands* in the *spring* time, which they call *streak-fallowing*; the manner is, to plough *one* furrow and leave *one*, so that the *Land* is but half of it ploughed, each ploughed furrow lying on that which is not so: when it is *stirred* it is then clean ploughed, and laid so smooth, that it will come at *sowing* time to be as plain as before. This is done when these *Lands* are not *swardy* enough to bear clean *tillage*, nor *calow* or light enough to lie to get *sward*, the intent is to keep the *Sun* from scorching them too much: But in most places they think this way of *tillage* wears their *Land* too fast, and therefore seldom use it.

67. As for *stony Land*, whereof there is but little can be properly so called but in the *Chiltern Country*, they give it for *Wheat*, *Peas*, and *Barly*, much the same *tillage* and *manure*, they do *Clay* in other places, adding the advantage of *chalking* it, which they have not elsewhere for their *clay grounds*, by which they much enrich it for some years, so that it bears excellent *wheat*, *barly*, *peas*; of which last those they call *Hampshire-kids*, if the *Land* be new chalkt, are counted most agreeable; where by the way let it be noted, that I said but for some years, for when once the *manure* by chalk is worn out, the *Land* is scarce recoverable by any other, whence 'tis *Proverbial* here, as well as some other parts of *England*, That *chalkt Land* makes a rich *Father* but a poor *Son*, thereby intimating the ruin of the *Land* in the end, it becoming

at last only fit for *Ray-grafs*, mixt with *Trefoil* as above.

68. Lastly, their *sandy* and *gravelly* light ground, has also much the same tillage for *wheat* and *barly*, as *clay*, &c. only they require many times but *two* ploughings, especially if for *wheat*, except the *fallow* be run much to *weeds*, and then indeed they sometimes afford it a *stirring*, else none at all. Its most agreeable *grains* are, *white*, *red*, and *mixt Lammas wheats*, and *miscellan*, i. e. *wheat* and *rye* together, and then after a years *fallow*, *common* or *rathe-ripe barly*: so that it generally lies still every other year, it being unfit for *hitching*, i. e. *Beans* and *Peas*, though they sometimes sow it with *winter Vetches*; and if ever with *Peas*, the small *rathe-ripes* are accounted the best: Its most agreeable *manure* is of *straw*, from the *Clofe* or *Mixen* half-rotten, which keeps it open, and suffers it not to bind too much, where subject to it; but if otherwise, the rottenest *dung* is the best.

69. Whereof, as upon all other *Lands* before mention'd, they lay about 12 *loads* upon a common *Field acre*, i. e. about 20 upon a *Statute acre*; but I find the business of *manuring Land* to have a great *latitude*, Men doing it here many times not according to their *judgment*, but according to the *quantities* they have, so that where the *quantities* of *manure* are but small and the *tillage* is great, the case is much otherwise, than where both *tillage* and *manure* are in a contrary condition. But however the case stand, I find this a general Rule amongst them, that they always *soil* that *Land* first and best, which is to bear three *Crops*; one on the *tillage*, another of *beans* and *peas*, and a third of *barly*, on the *beans* or *peas* brush; all which depend upon the single *manure* given it when it lay *fallow* for *wheat*: though I have known this order frequently inverted by the best *Husbandmen* on their richest *Lands*, sowing *barly* first, then *peas* or *beans*, and their *wheat* last, for which they allege this very good reason, That *wheat* following the *dung Cart* on their best *Land*, is the more liable to *smut*.

70. And so much for the ordinary *Manures* of this *County*, there being two others yet behind, viz. *Chippings* of *Stone*, and *woolen rags*, not altogether so common, which I have therefore thought fit to consider apart; the first whereof I met with at *Hornton* near *Banbury*, where the *chippings* of the *stone* they hew at their *Quarry*, proves a very good *manure* for their *Ground* thereabout, and is accordingly made use of, by reason no doubt of a *salt* that *stone* holds

holds, which being dissolved by the *weather*, is imbibed by the *Earth*, as hinted before in *Chap. 4.* of this *Essay*.

71. The 2^d sort I first observed about *Watlington*, and the two *Britwels*, where they strew them on their Land with good success; & I have heard since of several other *places* where they do the same. To this purpose they purchase *Taylers* shreds, which yet retaining somewhat of the *salt* of the *Fulling-earth* with which they were drest, do well enough; but I judge them not so good as other old *rags* first worn by *men* and *women*, which must needs beside be very well sated with *urinous salts*, contracted from the *sweat* and continual *perspiration* attending their *Bodies*. And in this Opinion I am confirmed by *Sanct. Sanctorius*, who is positive, that our *insensible evacuations*, transcend all our *sensible ones put together*^k, to that excess, that of eight pounds weight of meat and drink, be taken by a man in one day, his *insensible transpirations* use to amount to five^l. Now if so, our *clonths* must needs be so filled with a well rectified *salt*, left behind in the *percolation* of the *steams* of our *bodies*, that there can be nothing more rational; if well considered, then that they should be a very fit *manure* for Land; when unfit for other uses.

72. As to the *quantities* of Corn sown on the *statute Acre*, they differ much in proportion to the richness or meanness of the *land*; about two *busshels* of *wheat* and *vetches*, two *busshels* and $\frac{1}{2}$ of *barly*, *oats*, and *peas*, and a quarter of *beans* sufficing the poorer; whereas the richer *Land* will take up three *busshels* or more of *wheat* or *vetches*, three *busshels* and $\frac{1}{2}$ or upwards of *barly*, *oats*, *peas*, and sometimes six *busshels* of *beans*. Yet I have known some able *Husbandmen* afford more Seed to their poor than rich Land, giving this reason, That the Seed in the rich does *tillar*, i. e. sprout into several *blades* and spread on the ground, whereas on the poor Land its sprouts come all single, which therefore, say they, requires the more seed.

73. In the choice of their seed they have a double respect, first to the *grain* it self, and secondly to the *land* it grew on. As to the *first*, they take care that it be clear of all manner of seeds; that it be handsom round Corn, of an equal cize, which some of them call *Even shooting Corn*, or *well breasted*; such Corn being for the most part full of *kernel*, and the likeliest to give strong roots.

^k S. Sanctorii *Medicinæ Staticæ*, Lib. 1. sect. 1. *Aphorism. 4.* ^l *Ibid Aphorism 6.*

And in respect of the *soil*, they constantly choose *Corn* that grew on *land* of a quite different nature from that it is to be *sown* on ; but in general, they desire it from *land* that is well in *heart*, and rich in its kind. If they are to sow *wheat* upon *tillage*, they choose *wheat* sown before upon *bean stubs*, and when they sow upon *peas* or *bean stubs*, *wheat* sown before on *tillage* ; for *Clay* ground they have their *seed* from *Red-land* or *Chalk*, & *vice versa* ; for the other *soils*, that from *Clay* is esteemed the best, though that from *Red-land* is little inferior ; for *barly* they count that best which comes of new broken *laud* ; and for the rest, none so good as those that come from the richest *soils*.

74. Before they sow, if the place be subject to the annoyances of *Smutting*, *Meldews*, *Birds*, &c. they take care to prevent them either in the preparing or choice of their *grain*. Against *smutting* they both *brine* and *lime* their *Corn*, some making their *brine* of *urin* and *salt* ; or else sow *red-straw'd wheat*, which is the least subject to it of any. To prevent *meldews*, some sow pretty early, judging *Corn* most subject to that annoyance when sown late ; or else make choice of the *long bearded Cone*, that being the least subject of any *wheat* yet known to the inconveniencies of *meldews*, and of being eaten by *Birds*, and therefore also fittest to be sown in small *Inclosures*, as noted before in the sixth Chapter.

75. In Sowing they have their several methods, *viz*, the *single Cast*, the *double Cast* ; and as they call it about *Burford*, the *Hackney bridle*, or *riding Cast*. The *single Cast* sows a Land at one bout ; the *double Cast* is twice in a place, at two different bouts, *viz*. once from *furrow* to *ridge*, and afterwards from *ridge* to *furrow*. The *Hackney bridle* is two casts on a Land at one time, and but once *about*, though I find these two latter sometimes confounded, their *names* being interchangably applyed in different parts of the *County*. The *first* way is seldom used amongst them, only by the ancientest *Seeds-men* ; the *second* is their usual and most certain way ; the *last*, though the newest fashion, is but seldom used yet, though some have tryed it with good success, and perhaps may hereafter bring it more in practice, it having more speed than the *double Cast* to recommend it to use. They have also a way of sowing in the *Chiltern Country*, which is called sowing *Hentings*, which is done before the *Plough*, the *Corn* being cast in a straight line
just

just where the *plough* must come, and is presently *ploughed* in. By this way of *sowing* they think they save much *seed* and other charge, a dexterous *Boy* being as capable of sowing this way out of his *bat*, as the most judicious *Seeds-man*. But of this way more hereafter, when I come into *Buckingham-shire*.

76. Thus having run through, the *Tillage*, *Manures*, *Quantities* and choice of *Seed*, and the several ways of sowing the *Soils* of this *County*, I proceed to the *Instruments* used in their *tillage*: Amongst which, the *Plough* being the best, because the most useful *Engine* in the World, deserves the first place; of which there are two sorts used in *Oxford-shire*, the *Foot*, and *Wheel-plough*; whereof the first is used in deep and Clay Lands, being accordingly fitted with a *broad fin* share, and the *Horses* going always in a *string* and keeping the *furrow*, to avoid poching the Land; and the *second* in the lighter and stony Land, the *Horses* either going in a *string*, or two a breast, according as thought most suitable to the *tillage* in hand^m: This *Plough* when used in stony Land, is armed with a *round pointed* share, having also near the *chep* of the *Plough* a small *fin* to cut the roots of the grass, for in this Land the *broad fin* jumps out of the ground. The *foot plough* does best at the *benting*, *i. e.* ending of a Land, it going close up to a *hedge*, and not being subject to over-throw; whereas the *wheel plough*, if care and discretion do not meet in the *holder*, is apt to over-throw there, the Land being ridged; but goes much more light-som and easie for the *Horses* than the *foot plough* doth, which is the sum of the *Conveniencies* and *Inconveniencies* of both.

77. After *Ploughing* and *Sowing*, they cover their *Corn* with *Harrows*, whereof some have 4, 5, or 6 *bulls*, or *spars* apiece, each of them armed with five *tines*, and of a square form as at most other places. But at *Whitfield*, near Sir *Thomas Tippings*, I saw a great weighty *triangular Harrow*, whose *tines* stood not in rows after the manner of others, its use being in ground much subject to *Quitch-grass*, whose roots it seems continually passing between the *tines* of other *Harrows*, are not so easily dragged forth by them, as this, whose *tines* stand not in rows, and is drawn with one of the *Angles* fore-most, after the manner of a *Wedge*: Yet I could not find it answer'd expectation so well as to obtain in other places, most thinking the great square *Bull harrow*, drawn by the second

^m On light Land some count the treading of double Cattle advantageous to it.

bull on the *near side* of the *harrow*, to take the *Grafs* much better than that.

78. But the worst ground to *barrow* of all others is new *broken Land*, the parts of its furrows being commonly so fast knit together by the roots of the *grafs*, that though great charge and trouble be afforded in the *barrowing*, yet after all it will not so *disperse* the *Corn*, but that it will come up as it fell, thick and in ranks between the *furrows*, and scarce any where else. To prevent these inconveniencies, the Ingenious Mr. *Sacheverel*, late of *Bolscot*, deceased, contrived a way of *howing* the *earth* from the *turf* as soon as a little dried, thereby first laying his ground even and then sowing it; by which means his *seed* not only fell and came up equally dispersed in all parts alike, but he found that a quantity considerably less, did this way serve the turn. Which *Experiment* he often made with good approbation, the charge of *howing* not exceeding that of *barrowing*, which without it must be great, whereas after it, one *cross tine* covers the *Corn* well enough.

79. After *barrowing*, if it hath been so dry a time, that the ground has risen in *clods* that cannot be broken with *barrows*, they commonly do it with a *beetle*, or *big stick*: But a much quicker way is that I met with about *Biffeter* by a weighty *Roll*, not cut round, but *octangular*, the edges whereof meeting with the *clods*, would break them effectually, and with great expedition. I was shewed also at *Bolscot* another uncommon *Roll*, invented by the same Mr. *Sacheverel* above-mentioned, cut neither *smooth* nor to *angles*, but notched deep and pretty broad, after the manner of a *Tessella* or *Lattice*, so that the protuberant parts remained almost as big as the foot of a *Horse*, by which being large and weighty, he could so firmly press his *light Land* subject to *Quich-grafs* and other *weeds*, and so settle the roots of the *Corn*, that it would come up even and well; whereas if it had been left hollow it would certainly have been choaked, and came to little; He asserted, that it also excelled a smooth *Roll*, especially if the Season proved dry and windy, in that, when a Field is *rolled* smooth, the *wind* is apt to blow the *Earth* from the *Corn*, whereas by this the ground is laid so uneven and full of holes, like *Chequer-work*, that what the wind blows from the *ridges*, still falls into the *hollows* between them, and on the contrary gives the *Corn* the better root.

80. I have heard of another sort of *Roll*, of a large *diameter*, and weighty, set the whole length with edged plates of *steel*, prominent from the body of the *Roll* about an inch and half; thus contrived for the quicker cutting of *turf*, which drawn first one way, and cross again at *right angles*, cuts the *turf* into squares, in bigness proportionable to the distance of the edged *plates* on the *Roll*, requiring no farther trouble afterward, then to be pared off the ground with a *turfing Spade*, which seems to promise well for the cutting out of *Trenches*, *Drains*. &c. But this I have not seen, nor has it that I know of, been yet experimented by the ingenious *Inventor*: However, I thought fit to offer it to the consideration of *Improvers*, and the rather because it affords me a smooth transition from the consideration of the *Arable*, to the *Meadow* and *Pasture Lands*.

81. For the *Meadow grounds* of this *County*, as they are numerous, so they are *fertile* beyond all *preference*, for they need no other *compost* to be laid on them, than what the *Floods* spontaneously give them, and therefore the *Reader* must not expect any methods or rules concerning that affair here: Nor concerning the *remedies* of annoyances, such as *Sour-grass*, *Mosses*, *Rushes*, *Sedges*, &c. for I find none of our *meadows* much troubled with them. As for their *Up-lands*, when they prepare them for *grass*, they make them as rich as they can with their most suitable *soils*, and lay them also dry to keep them from *Rushes* and *Sedges*; if any thing *boggy*, they usually *trench* them; but that proves not sufficient, for the *trenches* of *boggy grounds* will swell, and fill up of themselves.

82. To prevent which inconveniency, I know an ingenious *Husbandman*, that having dug his *trenches* about a yard deep and two foot over, first laid at the bottom green *Black-thorn* bushes, and on them a *stratum* of large round stones, or at least such as would not lie close; and over them again, another *stratum* of *Black-thorn*, and upon them *straw*, to keep the dirt from falling in between, and filling them up: by which means he kept his *trench* open, and procured so constant and durable a *drain*, that the *land* is since sunk a foot or 18 inches, and become firm enough to support *carriages*.

83. As for the *Grasses* sown in this *County*, I have little more to add concerning them, but what was said before in the Chapter

of *Plants*, only that it has been found most agreeable that *Sanct-foin*, *Ray-grass*, &c. be not sown presently after the *Barly*, *Oats*, or whatever other *Grain* it be sowed with, but rather after the *Corn* is come pretty high, so that it may shelter the *seed* from the heat of the *Sun*, which, as is apprehended at least, is sometimes prejudicial. And that in the *Chiltern Country*, after they have eaten off their *Ray-grass* or *Sanct-foin*, they find it advantageous to fold it with *Sheep*, as other *Corn-lands*: which I thought good to note, it being, as I am informed, but lately practised.

84. Amongst *Arts* that concern formation of *Earths*, I shall not mention the making of *Pots* at *Marsh-Balden*, and *Nuneham-Courtney*; nor of *Tobacco-pipes* of the *White-earth* of *Shot-over*, since those places are now deserted. Nor indeed was there, that I ever heard of, any thing extraordinary performed during the working those *Earths*, nor is there now of a very good *Tobacco-pipe Clay* found in the Parish of *Horspath*, since the Printing of the third *Chapter* of this *History*. Let it suffice for things of this nature, that the ingenious *John Dwight*, M. A. of *Christ Church College Oxon.* hath discovered the mystery of the stone or *Cologne Wares* (such as *D'Alva Bottles*, *Jugs*, *Noggins*) heretofore made only in *Germany*, and by the *Dutch* brought over into *England* in great quantities, and hath set up a *manufacture* of the same, which (by *methods* and *contrivances* of his own, altogether unlike those used by the *Germans*) in three or four years time he hath brought it to a greater perfection than it has attained where it hath been used for many *Ages*, insomuch that the *Company* of *Glass-sellers*, *London*, who are the *dealers* for that commodity, have contracted with the *Inventor* to buy only of his *English manufacture*, and refuse the *foreign*.

85. He hath discovered also the mystery of the *Hessian wares*, and makes Vessels for reteining the penetrating *Salts* and *Spirits* of the *Chymists*, more serviceable than were ever made in *England*, or imported from *Germany* it self.

86. And hath found out ways to make an *Earth* white and transparent as *Porcellane*, and not distinguishable from it by the *Eye*, or by *Experiments* that have been purposely made to try wherein they disagree. To this *Earth* he hath added the colours that are usual in the colour'd *China-ware*, and divers others not seen before. The skill that hath been wanting to set up a *manu-
facture*

sure of this transparent *Earthen-ware* in *England*, like that of *China*, is the *glazing* of the white *Earth*, which hath much puzzled the *Projector*, but now that difficulty also is in great measure overcome.

87. He hath also caused to be modelled *Statues* or *Figures* of the said transparent *Earth* (a thing not done elsewhere, for *China* affords us only imperfect *mouldings*) which he hath diversified with great variety of *colours*, making them of the *colours* of *Iron*, *Copper*, *Brass*, and *party-colour'd*, as some *Achat-stones*. The considerations that induced him to this attempt, were the *Duration* of this hard burnt *Earth* much above *brass*, or *marble*, against all *Air* and *Weather*; and the softness of the matter to be modelled, which makes it capable of more curious work, than *stones* that are wrought with *chisels*, or *metals* that are cast. In short, he has so far advanced the *Art Plastick*, that 'tis dubious whether any man since *Prometheus* have excelled him, not excepting the famous *Damophilus*, and *Gorgasus* of *Pliny*".

88. And these *Arts* he employs about materials of *English* growth, and not much applyed to other uses; for instance, He makes the stone *Bottles* of a *Clay* in appearance like to *Tobacco-pipe clay*, which will not make *Tobacco-pipes*, though the *Tobacco-pipe clay* will make *Bottles*; so that, that which hath lain buried and useless to the *Owners*, may become beneficial to them by reason of this *manufacture*, and many working hands get good livelyhoods; not to speak of the very considerable *sums* of *English* *Coyn* annually kept at home by it.

89. About *Nettle-bed* they make a sort of *brick* so very strong, that whereas at most other places they are unloaded by hand, I have seen these shot out of the *Cart* after the manner of *stones* to mend the *High-ways*, and yet none of them broken; but this I suppose must be rather ascribed to the nature of the *Clay*, than to the *skill* of the *Artificer* in making or burning them, and should therefore have been mention'd in the *Chapter* of *Earths*.

90. At *Caversham*, near the Right Worshipful Sir *Anthony Cravens* (and at some other places) they make a sort of *brick* 22 inches long, and above six inches broad, which some call *Lath-bricks*, by reason they are put in the place of the *Laths* or *Spars* (supported by *Pillars*) in *Oasts* for drying *mault*, which is

" *Nat. Hist. lib. 35. cap. 12.*

the only use of them, and in truth I think a very good one too; for beside that they are no way liable to *fire*, as the *wooden Laths* are, they hold the *heat* so much better, that being once *heated*, a small matter of *fire* will keep them so, which are valuable advantages in the *Profession of Maulting*.

91. And which brings me to the *Arts* relating to *Stone*, they have lately also about *Burford*, made their *Mault kills* of *stone*; the first of them being contrived after an accident by *fire*, by *Valentine Strong*, an ingenious *Mason* of *Teynton*, much after the manner of those of *brick*, which for the benefit of other *Countries* where they are not known, I have caused to be delineated so far forth at least, as may be direction enough to an ingenious *Work-man*, in *Tab. 13. Fig. 1, 2.* whereof the first *Figure* shews the *front* of such a *Kill*, and the Letters

- a. *The Kill hole.*
- b. *The Pillars that support the principal Joists.*
- c. *The sloping away of the inside of the Oast.*
- d. *The ends of the Joists.*
- e. *The spaces between the Joists for the Laths.*

And the second *Figure*, the square above, immediatly supporting the *Oast-bair* and the *Mault*, wherein the Letters

- f. *shew the Flame-stone.*
- g. *The Pillars on which the principal Joists lie.*
- h. *The principal Joists.*
- i. *The shorter Joists.*
- k. *The Laths between the Joists.*
- l. *The spaces between the Laths.*

Which first *Kill* of *Valentine Strong*, built after this manner in *stone*, succeeded so well, that it hath since obtained in many other *places*; nor do I wonder at it, for beside the great security from *fire*, to which the old *Kills* were very subject, these also dry the *mault* with much less *fuel*, and in a shorter time, than the old ones would do; infomuch that I was told by one *Mr. Trindar*, an ingenious *Gentleman* of *West-well*, who shewed me a fine one of his own at *Holwell*, that whereas he could formerly dry with the ordinary *Kill* but *two Quarters* in a day, he can now dry *six*, and with as little *fuel*. Now if *Mault-kills* or *Oasts* made with ordi-

nary *stone* prove so advantageous, what would one of them do, if the *Joists* and *Laths* at least were made of the *Cornish warming-stone*, that will hold *heat* well eight or ten hours? or of *Spanish Ruggiola's*, which are broad *plates* like *tiles*, cut out of a Mountain of *red salt* near *Cardona*, which being well *heated* on both sides, will keep warm 24 hours?

92. To which may be added the *Invention* of making *Glasses* of *Stones*, and some other *materials*, at *Henly upon Thames*, lately brought into *England* by *Seignior de Costa a Montferratees*, and carried on by one *Mr. Ravenscroft*, who has a *Patent* for the sole making *them*; and lately by one *Mr. Bishop*. The *materials* they used formerly were the *blackest Flints* calcined, and a white *Crystalline sand*, adding to each pound of *these*, as it was found by solution of their whole mixture, by the ingenious *Dr. Ludwell* Fellow of *Wadham College*, about two ounces of *Niter*, *Tartar*, and *Borax*.

93. But the *Glasses* made of *these* being subject to that unpardonable fault called *Crizelling*, caused by the two great quantities of the *Salts* in the *mixture*, which either by the adventitious *Niter* of the *Air* from without, or warm *liquors* put in them, would be either *increased* or *dissolved*; and thereby induce a *Scabrities* or dull roughness, irrecoverably clouding the transparency of the *glass*; they have chosen rather since to make their *glasses* of a great sort of white *Pebbles*, which as I am informed they have from the River *Po* in *Italy*; to which adding the aforementioned *salts*, but abating in the *proportions*, they now make a sort of *Pebble glass*, which are hard, durable, and whiter than any from *Venice*, and will not *Crizel*, but endure the severest trials whatever, to be known from the *former* by a Seal set purposely on them.

94. And yet I guess that the difference, in respect of *Crizeling*, between the present *Glass* and the *former*, lies not so much in the *Calx*, the *Pebbles* being *Pyrites* (none but such I presume being fit for *vitrification*) as well as the *Flints*; but rather wholly in the abatement of the *salts*, for there are some of the *Flint glasses* strictly so called (whereof I have one by me) that has endured all trials as well as *these last*. But if it be found otherwise, that *white Pebbles* are really fitter for their turns than *black Flints*, I think

they have little need to fetch them from *Italy*, there being enough in *England* of the same kind, not only to supply *this*, but perhaps *Foreign Nations*. Which is all concerning *Arts* relating to *stone* and *glass*; except it be also worth notice, that *Venerable Bede* of this *University*, first brought Building with *stone*, and *Glass windows* into *England*^p.

95. Whence according to my proposed *method*, I proceed to the *Arts* relating to *Plants*; amongst which, the first that present *themselves*, are those that concern the *Herbaceous* kind. Of this sort we may reckon that ingenious *Experiment* made in *June*, 1669. by my worthy Friend *John Wills* M. A. and Fellow of *Trin. Coll. Oxon.* in order to find in what measure *Herbs* might *perspire*, wherein he made use of the following *method*. He took two glass *Vials* with narrow necks, each holding one *pound* 8 *ounces*, and 2 *drachms* of water, *Avoir de pois* weight: into one of these *glassses* filled with *water*, he put a sprig of flourishing *Mint* (which before had grown in the *water*) weighing one *ounce*; the other *glass* he also fill'd with *water*, and expos'd them both in a *window* to the *Sun*. After ten days time, he found in the bottle where the *mint* was, only five *ounces* and four *drachms* of *water* remaining, and no more, so that there was one *pound* two *ounces* and six *drachms* spent, the *mint* weighing scarce two *drachms* more than at first.

96. From the other *Glass*, where *water* was put of the same weight, and no *mint*, he found the *Sun* had exhale'd near one *ounce* of *water*, and therefore concluded it drew but so much out of the first *glass*, at least not more: So that allowing one *ounce* for what the *Sun* had exhale'd, there was in those ten days spent by the *mint*, one *pound* one *ounce* six *drachms* of *water*; and the *mint* being increased in weight only two *drachms*, 'twas plain the *mint* had purely expired in those ten days, one *pound* one *ounce* and four *drachms*, that is, each day above an *ounce* and half, which is more than the weight of the whole *mint*. Whence he concluded, that what *Malpighius* so wonders at in his Book *De Bombyce*, viz. that those *Animals* will sometimes eat in one day, more than the weight of their bodies, is out-done by every sprig of *mint*, and most other *Herbs* in the *Field*, which every *summers* day attract more nourishment than their own weight amounts too.

^p Vid. Comment. in Carmen Phaleucium Joh. Seldeni, before Hoptons Concordance of years.

97. Which the same ingenious *person* at least questions not (and therefore wishes tryals may be made) of the *Tithymali*, *Efulæ*, and especially of *Pinguicula* and *Ros Solis*, which last sucks up moisture faster than the *Sun* can exhale it, and is bedewed all over at *Noon-day*, notwithstanding its power: Nor doubts *be* but that *Wormwood*, and all other *Plants* that are very hot, and of strong smells, expire as much, if not more than *Mint*.

98. There are also several *Arts*, used about the *Corn* in this *County*, whil'st in the *blade*, and *straw*, that belong to this place, such as eating it off with *Sheep*, if too *rank*, to make it grow strong and prevent lodging: whil'st the *Corn* is young they also weed it, cutting the *thistles* with a hook; but *rattles* they hand-weed as soon as in *flower*, and so they do *cockles* when they intend the *Corn* for *seed*. If the *Crows* toward *Harvest* are any thing mischievous, as they many times are, destroying the *Corn* in the outer limits of the *Fields*, they dig a *hole* narrow at the bottom, and broad at the top, in the *green swarth* near the *Corn*, wherein they put *dust*, and *cinders* from the *Smiths* forge, mixt with a little *Gun-powder*, and in and about the *holes* stick *feathers* (*Crow-feathers* if they can get them) which they find about *Burford* to have good success.

99. They cut their *Wheat* here rather a little before, than let it stand till it be over-ripe; for if it be cut but a little too soon, the *stock* will ripen it, and the *Corn* will be beautiful, whereas if it stand too long, much will shatter out of the head in *reaping*, especially if the *wind* blow hard, and that the best *Corn* too; the worst only remaining, which will be pale in the hand, an unpardonable fault where the *Baker* is the *Chapman*. In reaping *Wheat* and *Rye* they use not the *sicle*, but a smooth edged *hook*, laying their *Corn* in small hand-fulls all over the *Field*; I suppose that it may the sooner dry, in case wet come before they *bind* it, which they do in very small *sheaves*, and very loose in comparison of some other *Counties*: They *stock* it rafter-wise, ten *sheaves* in a *stock*, which if set wide in the but-end, will be very copped and sharp at the top, and will bear out rain beyond hope, or almost credit.

100. They count their *Barly* ripe (as they do their *Wheat*) when it hangs the head and the *straw* has lost its *verdure*, which they mow with a *fithe* without a *cradle*, never binding but raking
it

it together, and cocking it with a *fork*, which is usually a *trident*, whose teeth stand not in a row, but meet *pyramidally* in a *center* at the staff: They let it lie in the *swathe* a day or two, which both ripens the *Corn* and withers the *weeds*. *Oats*, and all *mixed Corns* called *Horse-meat*, are Harvested sometimes with two reaping *books*, whereof the manner is thus: The *Work-man* taking a *book* in each hand, cuts them with *that* in his right hand, and rolls them up the while with *that* in his left, which they call bagging of *Peas*: Others they cut with a reaping *book* set in a *staff* about a yard long, and then they cut and turn the *Peas* before them with both hands till they have a *wad*, which they lay by, and begin again; and this they call cutting with the *staff-book*: But the *sithe* they say is much the speediest way, which if used with care, cuts them as well and clean, as either of the other.

101. After the *sithe* they *wad* both *Beans* and *Peas*, and so turn them till they are thoroughly withered and dry, and then *cock* and fit them for *carriage*, only with this difference, that *Beans* while they are *cocked* and *carried*, have the loose *stalks* pickt up by *hand*, the rake being apt to beat the *Beans* out of the *Pods*, as they are drawn up against the leg. All sorts of *Cocks* are best made of a middleing *cize*, and well top'd; the advantages are, that these are apprehended at least to take less wet with the same *rain* than greater, and will dry again without breaking; whereas the great *cocks*, after *rain*, must be pulled to pieces, which cannot be done without great loss, for in the opening and turning much *Corn* will be beaten out, and that certainly the best too.

102. If their *Corn* be brought home a little *moister*, or *greener* than ordinary, or the *weeds* be not let lie to be thoroughly shrunk or wither'd, that they suspect it may *beat* in the *Barn* more than ordinary (for it is kind for *Corn* and *fodder* to *beat* a little) then they draw a *Cubb* or *Beer-lip* (which others call the *Seed-cord*) up the middle of the *mow* or *stack*, and through the *hole* that this leaves, the *beat* will ascend and so prevent *mow-burning*; Or if it *beat* in the *Barn* beyond expectation, and be like to do amiss, they then pull a *hole* in the middle from the top to the bottom, which will also help it much. They draw an old *Axel-tree* of a *Cart* up a *Hay-rick* to the same purpose, if they think their *Hay* of the *greenest*, or over *moist* when *stacked*.

103. But

103. But the best contrivance I ever yet saw to prevent the *fire-
ing* of *Ricks* of *Hay*, or *Sainſt-foin*, I met with at *Tufmore*, at the
Worshipful *Richard Fermors* Esq; where they let in *ſquare pipes*
made of *boards* of a foot *diagonal*, to the middle of their *ſtacks*,
to give them *Air* perpetually ; the number of *pipes* bearing pro-
portion to the bigness of the *Ricks*, which no question may also
be as rationally applyed to *ſtacks* of *Corn*, whenever thought sub-
ject to the ſame danger.

104. To preſerve their *Ricks* of *Corn* lyable to *rats* and *mice*,
they commonly place them in this *Country*, on *ſtanders* and *caps* of
ſtone ; the *ſtanders* being four *Obeliſcs* about two foot high, and the
caps as many *Hemiſpherical ſtones* placed upon them, with the flat
ſides downwards, on which having laid four ſtrong pieces of
Timber, and other *Joists* to bear up the *Corn*, they place their *Ricks*,
which then are not annoyed by *mice* or *rats* (at leaſt not ſo much)
as *ſtacks* on the ground, by reaſon the *Hemiſpherical ſtones* being
planums at the bottom, though they may poſſibly aſcend the *ſtand-
ers* well enough, yet can ſcarce get up the *caps*, whoſe broad bot-
toms hang ſo over them in *plano Horizontis*, that they muſt needs
fall in the attempt.

105. The *Cart* they moſt uſe to bring home their *Corn*, is the
two-wheeled *long Cart*, having *ſhambles* over the *ſhafts* or *thills*,
a *Cart Ladder* at the breech, and *loops* over the *wheels*, on which
they will lay great and very broad *loads*, though it go not ſo ſe-
cure and ſteady as a *Waggon*, which notwithstanding that advan-
tage is of but little uſe here, only amongſt *Carriers*, &c. They
uſe alſo a ſort of *Cart* they call a *Whip-lade*, or *Whip-cart*, whoſe
hinder part is made up with *boards* after the manner of a *Dung-
cart*, having alſo a head of *boards*, and *ſhambles* over the *thills* ;
which *head* being made ſo as to be taken out or left in, the *Cart*
may be indifferently uſed to carry *dung* or other *matters* ; *dung*,
when the *head* is in, and *Corn*, &c. when taken out.

106. About *Banbury* moſt of their *Carts* have *Axel-trees* of
Iron, made *ſquare* at one end and *round* at the other ; at the *ſquare*
end they are made faſt into one of the *wheels*, and move round
together with it ; and at the other end they move within the *box*
of the *wheel*, and the *wheel* round them too : With this ſort of
Axel ſome are of opinion that the *Cart* moves much lighter for the
Cattle, than with a wooden one, to whom I ſhould much rather

assent, did the *round* end of the *Axel* move in a *box* of *brass*, and were the places where the *Cart* rests on it, lined with *brass plates*, for then a small matter of *oil* (as 'tis in the *oiling* of *bells*) would cause the heaviest weight to be moved with great ease: however as they are, much less *grease* serves the turn; and one of them made of good tough *iron*, will last a mans age, and sometimes *two*, whereas the wooden ones are frequently at reparations: nor does there any inconveniency attend *them* that I could hear of, but that the *wheels* have not so much room to play to and fro on *these*, as on the *others* of *wood*, and therefore not so good where either the *ways* or *Cart-routs* are deep.

107. Their way in this *Country* to bring the *corn* from the *straw*, is for the most part by the *flail*, only in some *places* when their *wheat* is very *smutty*, they have a way of *whipping* it first, and then *threshing* it afterwards: their manner of *whipping* is striking the *corn* by a handful at a time, against a *door* set on its edge; and when a *sheaf* is thus *whipt*, they bind it up again for the *flail*: which way indeed is troublefom and tedious, but by this means the *smut bags* or *balls* are preserved unbroken, and by the strength of a good wind, and care in the *raying*, most part of them may be gotten forth, and the *wheat* left clear.

108. But before they thresh *Rye*, they sometimes take care to preserve some of the *straw* whole or unbroken, to serve for *straw-works*: which I should not have thought worth mentioning, but that we have an *Artist* here in *Oxford*, the ingenious *Robert Wiseman*, excellent for such matters, beyond all comparison; and yet *he* modestly owns, that *he* saw work in *Italy* that gave him a hint for his *Invention*, but knows not whether that *Artist* (but believes rather the contrary) uses the same procedure that *he* does or no: However, if it must not be allowed his *Invention*, yet because *he* has improved it to so great an *excellency*, I cannot but let the *World* know, that though *he* professes nothing extraordinary in the *dying* of his *colours*, yet by certain *method*, of first scraping the *straw*, and cutting it into small square *pieces*, none longer than the 20th or 30th part of an *inch*, *he* can lay them on *wood*, *copper* or *silver* (first prepared for the purpose) in such order and manner, and that with great *expedition*, that thereby *he* represents the *ruins* of *Buildings*, *Prospects* of *Cities*, *Churches*, &c. upon *dressing* or *writing* *Boxes*, or *Boxes* for any other use.

109. He also represents in a most exquisite manner, both the *Irish* and *Bredth stitch* in *Carpets* and *Screens*, which he makes of this *straw work* for the more curious *Ladies*; and with these he covers *Tobacco boxes*, or of any other kind, whether of *wood* or *metal*, putting the *Arms* of the *Nobility* and *Gentry*, if desired, upon the *tops* or elsewhere: And all these with the *colours* so neatly *shaded off*, from one another, that at due distance they show nothing *inferior* to *colours* laid with a *Penfil*. When these *Prospects*, &c. are made, he can and does frequently wash his *work* with common *water*, letting it continue at least an *hour* underneath it; then dries it with a *sponge*, and beats it with a wooden *mallet* as thin as may be, and then lays it on his *boxes*, giving it lastly so curious a *polish*, that no *varnishing* excels it: which *work*, though made of such minute squares of *straw*, will endure portage, and any other as severe usage, as most other *materials*; none of them being to be gotten off by easie means, but will admit of *washing* and *polishing* again, when at any time foul, as well as at the first.

110. Which is all concerning *Corn*, whil'st in the *blade* or *straw*, what remains relates to the separating the *seed* from the *chaff*, and preserving it in the *stores*. As to the first, they either do it in a good *wind* abroad, or with the *fan* at home, I mean the *leaved fan*; for the *knee fan*, and casting the *corn* the length of the *Barn*, are not in use amongst them. They that have but small quantities, when no *wind* is stirring, will do it with a *sheet*; the manner thus: Two *persons* take a *sheet*, and double it at the *seam*, then rolling in each end a little, and holding one hand at the top, and the other a foot or 18 inches lower, they strike together and make a good *wind*, and some speed. But the *wheel fan* saves a *mans* labor, makes a better *wind*, and does it with much more expedition.

111. They preserve it in their *stores*, as well as *ricks*, from *mice* and *rats* by many *ordinary* means used in other places: but I met with one way somewhat *extraordinary*, performed by a peculiar sort of *Rats-bane*, that kills no creatures but those for which it is designed, except *poultry*; so that it is an excellent *remedy*, especially within doors, where *Fowls* seldom come, or any other place where they may be kept from it; all *Cats*, *Dogs*, &c. tasting it without hurt. To secure their *Corn* from musting, I have heard of some that have laid it in *Chambers* mixt with *Pebble-stones* of the

larger cize *stratum super stratum*, viz. after every fix inches thickness of *Corn*, a *stratum* of *Pebbles*, placed about a yard distance from each other, then *Corn* again to the same thickness, and so *S S S* to ten *lains* apiece : by which method, as I was told, *Corn* had been preserved sweet and free from *must*, ten years together, only removing it once a year, and laying it again as before ; and in the *Summer* time when the weather was dry, setting open the *windows* in the day time and shutting them at night.

112. To recover it from *mustiness*, to its pristin *sweetness*, some have laid it out all *night*, thin spread on *cloaths*, to receive the Evening and Morning *dews*, with so good success, that being dried again next day in the *Sun*, the ill smell has been quite removed. And thus I have done with the most uncommon *Arts* I have met with concerning *Plants* related to *Husbandry*, and the whole *Herbaceous* kind : where by the way let it be noted, as in *Chap. 6. §. 23.* that these *Arts* are called *uncommon*, not so much in respect of this, as of other *Counties*, where indeed they will seem so : and that I have written of them rather for the information of *strangers*, than the *Inhabitants* of *Oxford-shire*, as I must hereafter in other *Counties*, for information of this. Wherein if through my own *ignorance*, or *frowardness* of some *Husbandmen* (I dare not say all) I have failed of that *accuracy*, that might otherwise have been expected, I beg the *Readers* pardon, and promise amendment in the following *Counties*, provided I have encouragement to go on in my design.

113. After the *Herbaceous Plants*, come we next to consider the *Shrubs* and *Subfrutices*, amongst which I met with one, perhaps I may say scarce heard of *curiosity*, though it have been an *Experiment* frequently performed many years since, not only by those excellent *Gardeners* and *Botanists*, the two *Bobarts*, Father and Son ; but as I have heard also by the Reverend and Ingenious *Robert Sharrock* LL D, and Fellow of *New College*, who after many unsuccessful tryals of *grafting* one *Fruit* upon another, made at last a very pleasant one, and to good *advantage* too, upon different *Vines*, which in so great measure answer'd their hopes, that they have now signal proof in the *Physick Garden* of the *white Frontiniae* grafted upon the *Parsly Vine*, growing and bearing very well ; and to this *advantage*, that they think the early ripening stock of the *Parsly Vine*, to conduce somewhat to the
earlier

earlyer ripening of the *white Frontiniae*, naturally late.

114. They have also *grafted* the *early red-cluster* or *Current-grape*, upon that large, luxuriantly growing *Vine*, called the *Fox-grape*, which seems to produce much fairer and stronger *Fruit*; than that *grape* is usually upon its own *stock*. And divers other *Experiments* of this *nature* they say may easily be made, as well to have *white* and *black*, or other *varieties*, as they have already *broad leav'd* and *narrow leav'd*, *early grapes* and *late ones*, on the same *stock*: But this is not to be done by present *amputation*, as in other *Fruits*, the wood being not sufficiently solid to bear it.

115. As to the *Arts* relating to *Trees*, the chiefest are those of the *Planter* and *Gardener* making curious *Walks*, and *Topiary works* of them; such is the *Dial* cut in *Box* in *New College* Garden, the *Kings arms*, and the *College coat of arms* there, and at *Exeter College*; beside the other *Garden knots* of *Box* in both those *Colleges*, and in *Brasen-nose College* Quadrangle; to which add the *Guards* at the *Physick garden* gate of *Gigantick* stature, and several other *Topia* in the same *Garden*, all formed of the *Yew tree*. Of *Walks*, the most curious I have met with in this County, are those elegant ones of *Trees* of various kinds in *Cornbury Park*; and (to omit the numerous *Walks* in and about the *University*) those of *Firs* at *Sir Peter Wentworths* at *Lillingston Lovel*, and the pleasant *Vista* at *Sir Timothy Tyrrils*, from a short walk of *Trees* toward the *Chiltern hills*; and for a *close Walk* there is a fine one lately designed in *Grimes-ditch*, near *Ditchley*, a seat of the Right Honorable *Edward Henry* Earl of *Lichfield's*, about half a mile in length.

116. For *garden walks*, I think one of the longest I met with, was at the Worshipful Mr. *Clerks* at *Aston Rowant*. And for a descent, there are none like the *Walks* at *Rousham*, in the Garden of the Worshipful *Robert Dormer* Esq; where there are no less than *five* one under another, leading from the *garden* above, down to the *river side*, having *steps* at each end, and parted with *hedges* of *Codlings*, &c. But of all that I ever met with, there is a *Walk* at the Worshipful Mr. *Fermors* of *Tusmore*, the most wonderfully pleasant, not only in that it is placed in the middle of a *Fish-pond*, but so contrived, that standing in the middle no *Eye* can perceive but it is perfectly *streight*, whereas when removed to either end, it appears on the contrary so strangely crooked, that the *Eye* does not reach much above half the way,

117. Which

117. Which deception of sight most certainly arises from a *bow* in the middle, which seems only an *ornament*, and the *incapacity* of the *Beholder* of seeing both parts of the *Walk* at one time; which that it may be the better apprehended, see the manner of it, Tab. 13. Fig. 3. where the *letter a* shews the *walk* from the *garden* tending toward *that* in the *Fish-pond*, *b* the place of the *beholder*, *c* the *semicircle* or *bow* opposite to *him*, *d e* the two ends of the *walk*: Now the *beholder* being placed in *b*, and having the *bow* before *him*, is not commonly so wary as to find, that if the lines *f g b i* were continued, they would *decussate* and not fall into *straight* lines, nor that the *walks* themselves would do the same, because *he* sees but one *straight* part of the *walk b d* at one time, and the other *b e* at another time, which when seen together at either end, plainly meet in an *angle*, and by reason of the side *hedges* terminate the sight at little more than half way, at *k l*.

118. Hither also belong the *methods* whereby they order their *Woods* in this *County*, which if *Under-woods* in or near the *Forrest* of *Whichwood*, they commonly fell not till *twenty years* growth; but in the *Chase* near by it, sometimes at seven or eight: dividing them into *Acres* and *Braids* (or bredths) every *Acre* containing forty *braids*, a *braid* being one *pole* long and four broad; into which they thus divide their *Woods* for the better sale of them to the meaner sort of people, some buying ten, others twenty, and some thirty *braids* or more.

119. In the *Chiltern Country* they fell their *Under-wood Coppices* commonly at eight or nine *years* growth, but their *tall wood*, or *Coppices* of which they make *tall shids*, *billet*, &c. at no certain time; nor fell they these *Woods* all together, but draw them as they call it, almost every *year* some, according as their *wood* comes to be of a fit scantling for *tall shid* or *billet*, cutting every *shid* of *tall wood* four foot long beside the *kerf*, and the *billet* three foot four inches, according to the *Statutes* of the 7 of *Edw. 6.* 7. and the 43 of *Q. Eliz.* 14. which ought also according to the same *Statutes*, whether *round bodyed*, *half round*, or *quarter cleft*, to be of a certain number of *inches* about, according as named or marked of so many *Cast*, as may be seen particularly in the *Statutes* at large. Which is all concerning *Arts* relating to *Plants*, except it shall be thought worthy notice, that they use *ropes* in this *Country*,

try, made of the bark of the *Tilia fœmina folio minore*, small leav'd Lime or Linden tree, in some Countrys called *Bast*; whence the ropes are also called *Bastens ropes*; but of these no more, the Tree neither growing, nor the ropes being made in this County, but only used here.

120. Of Arts relating to Brutes, I have met with none extraordinary concerning the winged Kingdom, but the new sort of boxes, or Colony hives for Bees, first invented, I suppose, by the Right Reverend Father in God John Wilkins, late Lord Bishop of Chester; notwithstanding the pretensions of John Gedde Gent. and his seven years experience: for I find one of them set up in Wadham College Garden (where it still remains) when the said accomplish'd Bishop was Warden there above twenty years since. For Fish, I was shewed the model of a Net contrived by the ingenious Sir Anthony Cope, that seemed likely to catch all found within such a compass.

121. Relating to four footed Beasts, the ingenious Richard Fermor of Tusmore Esq; shewed me a pretty contrivance to avoid the incumbrance of Oat tubs in Stables, especially where they are any thing streightned in their room, by letting the Oats down from a loft above, out of a vessel like the Hopper of a Mill, whence they fall into a square pipe let into the wall, of about four inches diagonal, which comes down into a Cup-board also set into the wall, but with its end so near the bottom, that there shall never be above a gallon, or other desirable quantity in the cup-board at a time, which being taken away and given to the Horses, another gallon presently succeeds; so that in the lower part of the Stable where the Horses stand, there is not one inch of room taken up for the whole provision of Oats: which contrivance has also this further convenience, that by this motion the Oats are kept constantly sweet (the taking away one gallon moving the whole mass above) which laid up any otherwise in great quantities grow frequently musty.

122. The same ingenious Gentleman has also applied the same contrivance, with some little alteration, to the feeding of his Swine, which have constantly their meat from such a vessel like the hopper of a Mill placed over the sty, into which having put a certain quantity of beans, enough to fat so many Hogs, they continually descend to about half way down the sty in a large square pipe, which then divides it self into six smaller ones, which terminate each

each of them in a small *trough*, no bigger than just to admit the *nose* of a *Hog*, and come all of them with their *ends* so near the *bottom*, that there is never above a handful of *beans* or so, in each *trough* at a time, which taken away by the *Hogs*, there follow so many handfulls again, but never more : so that having also drawn a small *Rivulet* of water through the *fly*, the daily trouble of *servants* waiting on them is not only saved (for they need never come near *them* till they know they are *fat*) but the *Hogs* themselves are also made hereby incapable of spoiling a *bean*, by trampling or pissing amongst them as in most other *flies*, they never having above a handful at a time, and those in a *trough* too small to admit any such means of *wast*.

123. He has thoughts also of applying the same *contrivance* to the feeding of his *Hounds* ; and has made *stalls* for *Oxen*, by *spars* of wood descending perpendicularly from the utmost *rim* of the *rack*, and nailing boards on them half way up before the *Oxen*, that they cannot spoil by trampling, or any other means, the least *straw* or *grass*, all that go beside their mouths falling still within the boards nailed upon the *spars*, which when come to any quantity, is returned into the *rack* as sweet and good, as when put there at first. Which being matters of *Architecture* relating to *Beasts*, bring me next to treat,

124. Of *Arts* that respect *Mankind*, and first of *Architecture*, wherein we have many remarkable *Curiosities*, as well in the *Country* as *University* ; some whereof are of an *inferior*, others of a more *Honorable* rank and quality. Of the first sort are several *Mills* that I have met with in this *County*, scarce perhaps to be found elsewhere in *England* ; such is that at the same ingenious Mr. *Fermors* at *Tusmore*, which with one *horse* and *man* (who is carried round as it were, in a *Coach-box* behind the *horse*) performs at pleasure these very many *offices*. First, it grinds *Apples* the common way for *Cider*. And secondly *Wheat*, which it *sifts* at the same time into four different finenesses. Thirdly *Oats*, which it cuts from the *husk*, and *winnows* from the *chaff*, making very good *Oat-meal*. And lastly makes *Mustard*, which indeed is a meer *curiosity*. And all these it performs severally, or together, according as desired.

125. At *Hanwell*, in the *Park*, there is also a *Mill* erected by the ingenious Sir *Anthony Cope*, of wonderful contrivance, where-with that great *Virtuoso* did not only grind the *Corn* for his House, but

but with the same motion turned a very large *Engine* for cutting the hardest stone, after the manner of *Lapidaries*; and another for boring of *Guns*: and these, as in the *Mill* at *Tusmore*, either severally or all together, at pleasure.

126. To these add the *Mills* for making *French Barly*, erected some years since upon the *river* near *Caversham*, by one Mr. *Burnaby*, but are now carryed on by one Mr. *Nelthrop* of *London*, Merchant: They are four in number, and differ from other *Corn mills* chiefly in the following particulars. 1. In that they have always *double tackling*. 2. The *stones* not being the *Cologne*, but ordinary *white stones*; which thirdly, are both of them cut the *sending way*: and fourthly, the upper *stone* or *runner*, hung about a hands breadth distant from the *lower* or *bed stone*, also called the *Legier*. They put in the *Corn*, about half a bushel at a time, not at the *eye*, but round the *hoops* at the sides of the *stones*; they stop the *spout* or *tunnel*, and let the *Mill* run just an hour, for if the *Corn* stay longer the *beat* will turn it *yellow*: then they let it out, and sever the *bran* and *flower* from the *Corn*, and put it up again into another *mill* of the same kind, and let it run in the same manner another hour, and the *work* is finished.

127. Hither also must be referred the *Mault Kills* of *Henly*, so thriftily contrived, that the *Kill boles* are placed in the backs of their *Kitchen Chimneys*, so that drying their *mault* with wood, the same *fire* serves for *that*, and all the other uses of their *Kitchens* beside. To this place also belongs a sort of *Oast* made about thirty years since by one *Philips* a Baker of *Magdalen Parish Oxon*, who having a very great *Oven*, made it plain at the top and plaister'd it over, whereon laying *mault*, he dried it with the same *fire* that heated his *Oven* for the bread, and thus made the best *mault* that *Oxford* afforded, and of necessity the cheapest, for the *fire* cost him nothing. I have heard also of the same *method* used at *Henly* on the *Thames*; and these, as some have ventured to assert, gave the first hints to the *Invention* of that sort of *Kills* whereby they dry *mault* with *coal*; but herein I dare not be too confident, not knowing of what standing those *Kills* are, otherwise the thing seems to be likely enough.

128. Thus having run through those of *inferior* rank, I come next to the remarkable *curiosities* of *Architecture* in our most *stately buildings*, and that have a more immediate relation to *mankind*

than any before mentioned, whereof some are *private*, others *publick*; and may both be considered either in the *whole* or *parts*. Of *private buildings*, the most eminent in this County, are the *Seats* of the Right Honorable the Earl of *Anglesey*, Lord Privy Seal; at *Blechington*, the Earl of *Clarendon* at *Cornbury*, the Earl of *Lichfield* at *Ditchley*, the Earl of *Rocheſter* at *Adderbury*, the Counteſs of *Down* at *Wroxton*, the Lord Viſcount *Say* and *Seal* at *Broughton*, the Lord Viſcount *Falkland* at *Great Tew*, the Lady *Abergavenny* at *Sherbourn*, the Lord *Norreys* (His Maſteſties Lord Lieutenant of *Oxfordſhire*) at *Ricot*, the Lord *Carrington* at *Ledwel*, and of the Honorable *James Herbert* Eſq; at *Tythrop* in *Oxfordſhire*, though of *Kingſey* Pariſh in the County of *Buckingham*.

129. Whereunto might be added ſeveral *ſtructures* of the *minor Nobility*, that ſhew a great deal either of paſt or preſent Magnificence, ſuch as that of the Right Worſhipful Sir *Anthony Cope* late of *Hanwell*, of Sir *John Cope* at *Bruern Abbey*, Sir *Tho. Spencer* at *Tarnton*, Sir *Tho. Chamberleyn* at *Northbrook*, Sir *Francis Wenman* at *Thame-Park* and *Cafwel*, Sir *Tho. Cobb* at *Adderbury*, Sir *Anthony Craven* at *Caversham*, Sir *William Glyn* at *Amersden*, Sir *Robert Jenkinſon* at *Walcot*, Sir *William Walter* at *Sareſden*, Sir *Thomas Penyſton* at *Cornwel*, Sir *Compton Read* at *Shipton* under *Whichwood*, Sir *John D'Oyly* at *Chiſlehampton*, Sir *Edward Norreys* at *Weſton* on the green, Sir *George Croke* at *Waterſtoke*, Sir *Philip Harcourt* at *Stanton Harcourt*. And of the worſhipful *Tho. Stonor* at *Watlington Park* and *Stonor*, Eſq; *Robert Dormer* at *Rouſham*, Eſq; *Richard Fermor* at *Tuſmore* and *Sommerton*, Eſq; *John Stone* at *Brightwel*, Eſq; *John Clerk* at *Aſton Rowant*, Eſq; *Tho. Hoard* at *Coat*, Eſq; *Arthur Jones* at *Chaſleton*, Eſq; *Baſil Brook* at *North-Aſton*, Eſq; and the ſeats of the Families of *Knolles* at *Rotherfield*, *Grays*, and *Blount* at *Maple-Durham*, Eſqs; To which add the *Parſonage* Houſe of the Rectory of *Chinner*, little inferior to ſome of the aforementioned, either in *greatneſs*, *commodiouſneſs*, or *elegancy* of Building.

130. And yet amongſt all theſe eminent private *Structures*, could I find nothing extraordinary in the *whole*: But in the *parts*, the *Kitchen* of the Right Worſhipful Sir *Philip Harcourt* Knight, of *Stanton Harcourt*, is ſo ſtrangely unuſual, that by way of *Riddle* one may truly call it, either a *Kitchen* within a *Chimney*, or a *Kitchen* without one; for below it is nothing but a large *ſquare*,
and

and *octangular* above ascending like a *Tower*, the *fires* being made against the *walls*, and the *smoak* climbing up them, without any *tunnels* or disturbance to the *Cooks*; which being stopped by a large *conical* roof at the top, goes out at *loop-holes* on every side according as the *wind* fits; the *loop-holes* at the side next the *wind* being shut with falling doors, and the adverse side opened.

131. The spacious *Stair-case* at *Blechington-house* is also remarkable, not only for that it stands on an *Area* of 30 foot square, but for its rarity too, it being not perhaps at all, at least not easie to be met with amongst the writers of *Architecture*: wherefore, though I cannot approve of its *contrivance* in all particulars, yet for the sake of its *magnificence*, and *variety* from most, if not all others, I cannot in justice but afford it a short description.

132. It being placed therefore backward, opposite to the most honorable *entrance* of the House, between two *wings* that extend themselves beyond it, and the *grofs* of the *Pile*, you enter upon it having past by the *ball*, and other *offices* usually placed by it, at the *door-way* A, *Tab. 13. Fig. 4.* and land upon the *half pace* 1, which together with the *rest* marked 2 3 4, &c. are 6 foot $\frac{1}{2}$ square: The *figures* in their natural order shew how you ascend from one *half pace* to another, by *ascents* of 7 steps, each about 5 inches $\frac{1}{2}$ deep, and near 10 inches $\frac{3}{4}$ broad: The *half paces* marked with the same *figure* lye on the same *level*, and therefore as 4 is the highest *half pace* in this first *Scheme* of it, so it is the lowest in the second, *Tab. 13. Fig. 5.*

133. In which also the order of the *figures* shews the manner of *ascent* just as in the former, only it must be observed, that as the *ascent* to the *half pace* 4 in the first *Scheme*, was suppose from *East* and *west*, so the *ascent* higher from it in the second, is to *North* and *South*: Of which two *Schemes* placed alternatly over one another, the whole *stair-case* is framed from bottom to top, which is easily apprehended, if you but imagine the *half pace* 4 in the second *Scheme*, to be placed over 4 in the first, and such another *frame* as is delineated in the first *Scheme* to be placed on the second: The *Letters* VV shew the vacancies that open a *Prospect* from the top to the bottom of the whole *stair-case*, and a b c d shew the places of the *doors* into the *rooms* at each corner of it.

134. In short, this *stair-case* seems to be a composition of 4 half-pace-open-newel'd *stair-cases*, as may easily be perceived by the *figures*, 123, 123, 123, 123, and 567, 567, 567, 567, only communicating in the middle; which indeed shews very magnificently, but has this inconvenience, that there is no passage from one *room* into *another* though on the same *floor*, without going up and down many steps; as in *Scheme* the second, if from *a* to *b*, and so of the *rooms* of any of the other sides, you have no *passage* but from 6 to 7, and so down again to 6, *i. e.* 14 steps. But if you are to go from corner to corner, as suppose from *a* to *c*, or *b* to *d*, & *vice versa*, whether you pass round the sides, or over the middle *half pace*, you cannot do it, without ascending and descending in all twenty eight steps.

135. Of publick Buildings, the most eminent in the *County* are certainly those of the *Colleges* and *Halls*, the *Publick Schools*, *Library* and *Theater* in the *University of Oxford*; of which yet in the whole I shall give no account; their magnificence and outward *Architecture* being already sufficiently shewn, by the exquisite hand of Mr. David Loggan, *Chalcographer* to the *University*, in his *Cuts* of them all lately set forth. It shall suffice me therefore to give a succinct account of some particular parts of them, whether in the *stone* or *Timber-work*, scarce to be met with elsewhere, or known to few.

136. Of the first sort is the *flat floor* of *stone* over the passage between the Right Reverend the *Provosts* Lodgings, and the *Chapel* at *Queens College*, born up only by the *side walls* without any *pillar*, though consisting of divers *stones* not reaching the *walls*, which yet indeed may very well be, since as I am informed by the same Right Reverend *Provost*, and *Bishop* of *Lincoln*, who pulled up the boards of the *room* above to view the *curiosity*; the *stones* are all *cuneiform*, and laid like that they call *straight Arch-work*.

137. The Roof of *Merton College Treasury* is also an odd piece of *stone-work*, being all made of *Asbler*, yet slooping to an *angle* (only more acute than usual) like *roofs* made of *Timber*: It has, 'tis true within, three inequidistant arched *ribs* of *stone* that seem to support the *Fabrick*, which is about 20 foot long, but the *stones* not reaching from *rib* to *rib*, and seeming to be laid like common *pavement* both within and without, make many to wonder that it does not fall in: but the *stones* being pretty thick, and cut as they call

call it, with an *arching joint*, must necessarily lye as firm (and for the very same reason) as those at *Queens College* do, and so most certainly they would, were the *arches* quite removed. There is also much such another *roof* over a little *Oratory* or *Chappel* in the *Church of North Leigh* in this *County*.

138. As for *arched roofs of stone*, that of the *Divinity School* is a fine piece of *Architecture*; and so is that of the stately *stair-case* leading into *Christ-Church great-hall*. The *Physick garden gate* is a curious piece of *rustick rock-work*; and the *Portch* at *St. Maries*, the *University Church*, is a well contrived thing. And were it not improper amongst these to mention a *structure* of so inferior a quality, as *New College house of Easement*, commonly called the *long-house*, I could not but note it as a stupendious piece of *building*, it being so large and deep, that it has never been emptyed since the foundation of the *College*, which was above 300 years since, nor is it ever like to want it.

139. The *Portico's* on the *East* and *West* sides of the *New Quadrangle* at *St. Johns College*, built by the most Reverend Father in God, *William Laud Arch-Bishop of Canterbury*, supported with *pillars of Bleckington Marble*, are well worthy notice; and so is the *Cloyster* at *Magdalen College*, the *Butteresses* without being curiously adorned with *Hieroglyphical Imagery*.

140. The erect Southern declining *Dial* over *All Souls College Chappel*, is a neat piece of work, so curiously contrived by Sir *Christopher Wren*, that though it stand high, yet by the help of two *half rays*, and one *whole one* for every *hour*, one may see to a *minute* what it is a *clock*, the *minutes* being depicted on the sides of the *rays*, viz. 15 on each side, and divided into *fives* by a different *character* from the rest.

141. The *Cylindrical Dyal* in *Corpus Christi College Quadrangle*, set at right angles with the *Horizon* (the common *sections* whereof, with the *hour circles* (except the *Meridian circle* which divides it by the *axis*) as also the *Æquinoctial*, are all *Ellipses*) is a fine old piece of *Gnomonicks*; of which no more, because its Contriver Mr. *Robert Heggs*, Fellow of the *College*, has already written of it^a. And the *Dials* made upon a pile of *Books* on *New College Mount*, with *Time* on the top, exactly pointing out from what *Quarter* the wind blows, upon the 32 *Points* of the *Compass*, depicted on

^a *Tract. de Horologiis, Lib. 4. cap. 4. MS. in Biblioth. C.C.C.*

a *Cylinder of stone*, is an ingenious contrivance.

142. There are many lofty *spires* about the *Country* as well as *City*, built all of *Free-stone*, and of exquisite workmanship, such as those of *Bampton, Witney, Burford, Bloxham, Spelsbury, Kidlington, &c.* but that which excels all the rest is the *spire* of *St. Mary's* in *Oxford*, the *University Church*, the Battlements whereof were repaired, and thus thick set with *Pinnacles* as it now stands, by *Dr. King* Dean of *Christ Church*, then *Vice-Chancellor* of the *University*, afterwards *Bishop of London*.

143. For *Towers*, that of *Merton College* is a large well built thing; and so is that of the *Schools*, but more remarkable, for that it is adorned on the inner side next the *Quadrangle*, with all the orders of *Pillars*. But for a neat plain piece of work, that of *Magdalen College* excels all I have yet seen, adorned on the top with well proportion'd *Pinnacles*, and within with a most tunable sweet ring of bells.

Miraris Turrim egregiam sacro Ære sonantem.

144. Amongst curiosities in *Timber-work*, we may reckon several screens in *College Chappels*; such as that of *Magdalen College*, that of *Cedar* at *Lincoln College*, and another at *Corpus Christi* now erecting. There is an *Altar rail* at *All Souls College* of curious workmanship, and to this place belongs the *Tomb* of *St. Frideswide*, still remaining at *Christ Church*, the top whereof is wood, and a fine old piece of work: But not comparable to the *Tomb* of *fair Rosamund* at *Godstow*, in the Chapter-house of the *Nuns* there, which according to the description of *Ranulph Higden* seems to have been also of wood, and of wonderful contrivance, *cista ejusdem puellæ* (says he, having spoken before of her death and *Epitaph*, and of the *Amour's* between her and *K. Henry the second*) *vix bipedalis mensuræ, sed mirabilis architecturæ ibidem cernitur, &c.* i. e. That her chest coffin or tomb was there to be seen, not above two foot long, or perhaps rather square, but a stupendous piece of workmanship, in qua (says the same Author at the same place) *conflictus Pugilum, gestus animalium, volatus avium, saltus piscium absque hominis impulsu conspiciuntur, i. e.* where in might be seen the conflicts of champions, the gestures of animals, the flights of birds, with fishes leaping, and all done without the assistance of man.

* *Ranulphi Higden Polychron. Lib. 7. in Hen. 2. MS. fol. in Bib. Bod.*

145. By what means this was effected, we are not informed by the afore-cited Author, but the Learned *Thomas Allen* M. A. of *Glocester-hall*, thought it might be done by a sort of *Looking-glass*, whose structure he found mentioned in an ancient MS, *De Arcanis & Secretis*, with this Title, *Speculum in quo uno visu apparebunt multæ imagines moventes se*. To be made thus, *accipe pixidem bene profundam, & pone in fundo ejus speculum commune, sc. convexum, postea, &c.* Take, says the Author, a deep box, and place in the bottom of it a common *convex glass*, then take 6 or 7 other *convex glasses* of the same bigness, and scrape off the *lead* [*plumbum* is the word] in the *concave* part with a knife; where by the way the Author advises, that since it is very hard to get the *lead* clean off without breaking the *glass*, that *Quick-silver* be made use of, to anoint the *lead* to get it off.

146. These *glasses* when made *clean*, he orders to be put into the box, so as they may stand *obliquely* in divers positions, in this manner: When the first *glass* is put in the bottom, the second must be so put, that one side of it must touch the first *glass*, and the opposite side be distant from it an inch, & *sic* (says he) *oblique pones in pixide*. In the top there must be put one cleansed *glass* as the first, *plain* and not *obliquely*, so that nothing must be seen but the uppermost *glass*, into which if you look, you shall see as many *Images* as *glasses*; and if turned round, how one *Image* always stands still in the middle, and the rest run round it, as if they went about to dance. Of which *contrivance*, though I understand not some particulars, yet I thought fit to mention them, because they may possibly meet with a *Reader* that may, and translate them too as well as I could, for the benefit of them all. As for those that have opportunity, and are desirous of seeing the *Latin Copy*, they may find it in a *Miscellaneous MS.* in Mr. *Seldens* Library*. For my part, all that I can add concerning it, is, that I have seen a sort of *Cabinets* of this nature, that by the help of *glasses* placed *obliquely* have shewn such pretty *prospects*.

147. The great *bivalve wooden windows* in the upper Gallery of the *Theater*, are so ingeniously contrived, that notwithstanding their great *weight*, yet can never sink so as to be brought out of *square*, as 'tis usual in such *windows*, for the *Iron bars* crossing them from side to side, not being set at right *angles*, but *diagonally* like

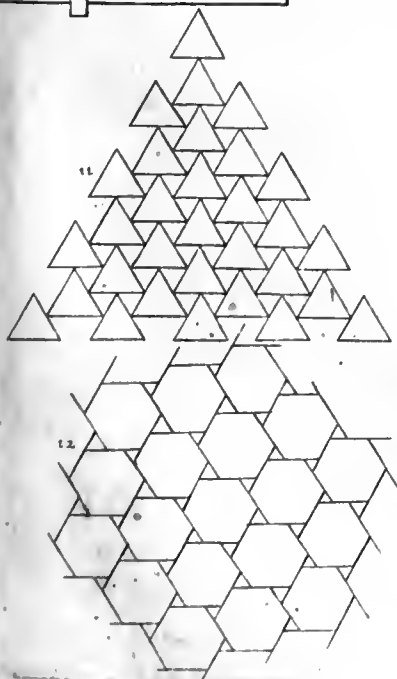
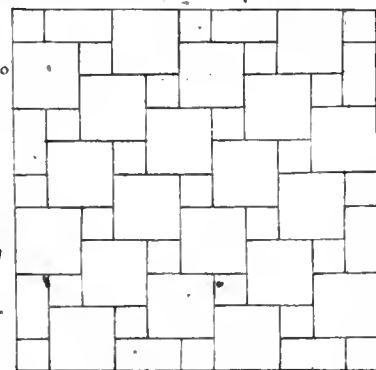
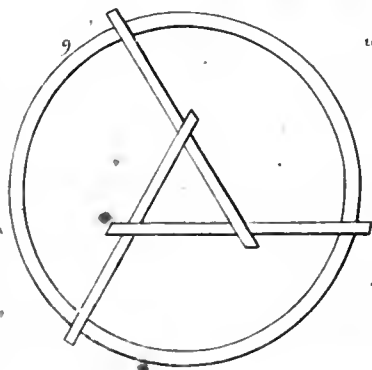
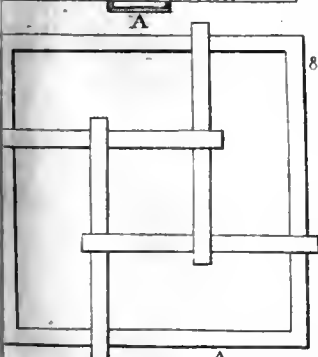
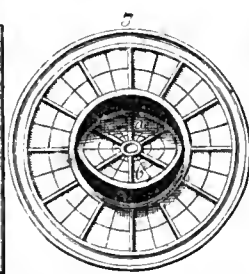
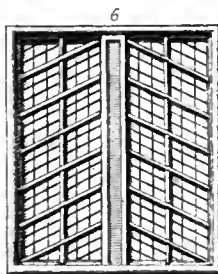
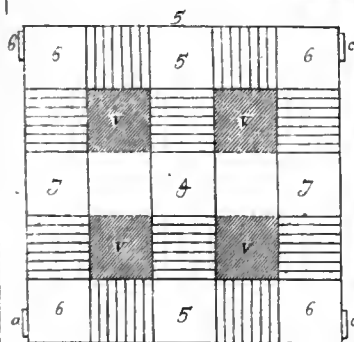
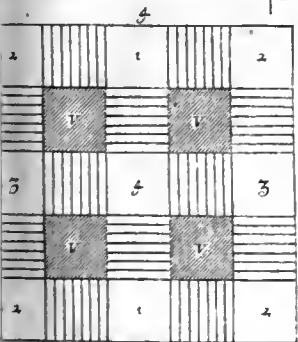
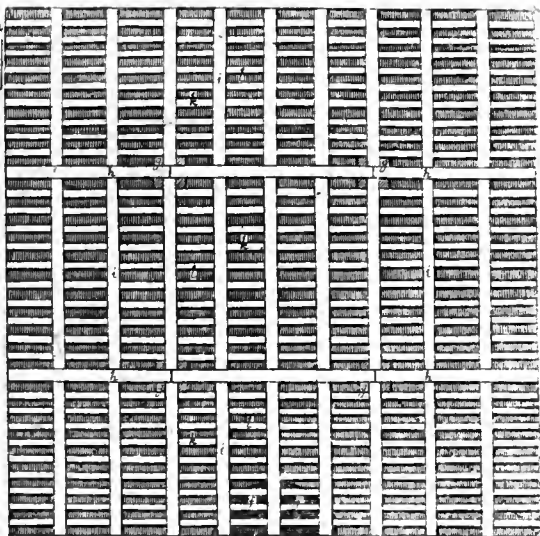
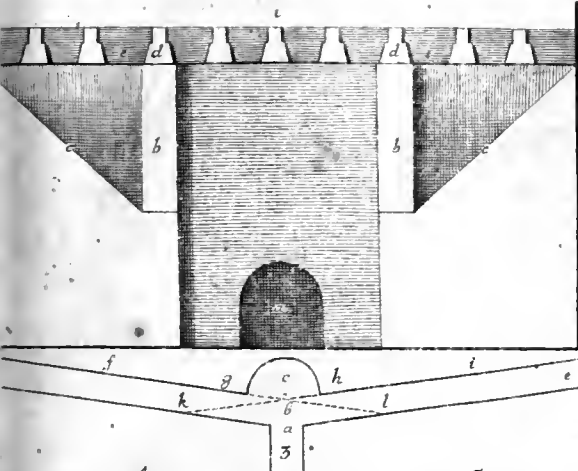
* 4^o MS. 79. in Biblioth. Selden.

struts or *braces*, as in *Tab. 13. Fig. 6.* must necessarily bend or break before the *window* can sink. Nor are the *round windows* below unworthy consideration, being contrived to admit *air* in foul weather, yet not one drop of *rain*; for being opened and set *obliquely*, as in *Tab. 18. Fig. 7.* it receives the *rain* within at *a*, and casts it out again at *b*; much less will it admit *rain* any ways when *shut*, it closing within its *frame* at the top, and without it at the bottom.

148. It was an excellent *device*, who ever first contrived it, of making *flat floors* or *roofs* of short pieces of *Timber*, continued to a great breadth without either *Arch-work* or *Pillar* to support them, being sustained only by the *side walls* and their own *texture*; for by this means many times the defect of long *timber*, or mistakes of *Work-men*, are supplied and rectified without any prejudice to the *Building*. Of this sort of work we have an example in the *Schools*, in the *floor* of the uppermost *room* of the *Tower*, but to be seen only in the *room* underneath where the *Records* of the *University* lye. There is also a *diagram* of such work in the *Architecture* set forth by *Sebastian Serly*[†], for which reason I think I should scarce have mention'd it, but that the Reverend and Learned Dr. *John Wallis*, *Savilian* Professor of *Geometry* here, was the first that demonstrated the reason of this *work*, and has given divers forms of it beside the fore-mentioned, in his Book *De Motu*, whence I have taken the *diagrams*, *Tab. 13. Fig. 8, 9, 10, 11, 12*[″]. to make them more publick; upon the two *first* whereof depend the three *last*, and all others of the kind what ever, whether made up of *quadrats* or oblong *parallelograms*, of which there are some other forms in the fore-cited Book *De Motu*, beside that engraven *Fig. 10.* consisting of great and small *Quadrats*; or *Triangles* alone, as *Fig. 11.* or mixt with *Hexagons*, as *Fig. 12.* to which Book I recommend the *Reader* for further satisfaction concerning them.

149. But of all the *flat floors* having no *Pillars* to support it, and whose *main beams* are made of divers pieces of *Timber*, the most admirable is that of the *Theater* in *Oxford*, from side wall to side wall 80 foot over one way, and 70 the other, whose *Lockages* being so quite different from any before mentioned, and in many other *particulars* perhaps not to be parallel'd in the *World*, I have taken care to represent an exact draught of it, *Tab. 14. Fig. 1.*

[†] Seb. Serlii *Architect. Lib. 1. de Geom. cap. 1.* [″] Wallisii *Mechanica sive de Motu, Parte 3. de vecte cap. 6. prop. 10.*



150. Wherein *a a a* and *b b b* shew the *walls* of the *Theater* that support this *frame* of *timber*, and the places of the *pilasters* of the *rail* and *ballister* round it; *c c c* and *d d d* the *leads* and *pipes* let down into the wall for conveyance of *water*; *e e e* and *f f f* the *wall plate* or *lintel*, and places of its joints; *g g g* the *girders* of the *semi circle*, each supported by a *King piece* or *Crown post* cut off at *b b b*, and screwed into the *binding beam* *i i i*; which is somewhat different from the rest of the *binding beams* *k k k*, *l l l*, *m m m*, *n n n*, having several *prick-posts* let into it at *o o o o*, beside the *King-posts* that support this and the rest at *p p p p p*, &c. The Letters *q q q* shew the *purlines* between the *binding beams*, not set right against one another because of room to turn the *screws* whereby they are fastened, and *r r r r* two *dragon* (perhaps rather *Trigon*) *beams* or *braces* lying under the *joists* *ss ss ss*, &c. the true *lengths* and *distances* whereof, and of all other pieces of *timber* and *places* whatever, are all shewn by the *scale* *Fig. 2*.

151. And so are the *lengths* and *distances* of the several pieces of *timber* set over this *flat floor*, such as the *principal rafters* *t t t t*, the *Crown posts* or *King pieces* *u u u u*, the *prick posts* *w w w*, *braces* or *punchons* *x x x*, by all which together the *binding beams*, *girders*, *joists*, &c. are all held up as it were by an *Arch* above, as in *Tab. 14. Fig. 3*. which is the whole *band* of *Timber* that stands next the *semi circle*, having *prick posts* and different *lockages* from the rest of the *four bands*, as is sufficiently represented by one *half* of one of them, *Tab. 14. Fig. 4*.

152. Which is all I think need be said concerning this fine piece of *Timber-work*, only that there are *cross braces* between the middle *Crown posts* as they stand in a line from the *front* to the *semi circle*, as is represented *Tab. 14. Fig. 5*. mark'd with the letters *y y y y y* both here, and as they stand *Fig. 1*. And that it was contrived by our English *Vitruvius*, the Right Worshipful and Learned Sir *Christopher Wren*, and worked by *Richard Frogley* an able *Carpenter*; and both *this*, and the *stone-work* too, at the sole charge of the most Reverend Father in God *Gilbert*, by Divine Providence, Lord Arch-Bishop of *Canterbury*, Primat of all *England*, and Metropolitan, who finishing, and having endowed it with a competent *Estate* for its reparations for ever, It is like to stand a most magnificent and lasting *monument* of his *Graces* Munificence, and favor of good *Learning* to all posterity.

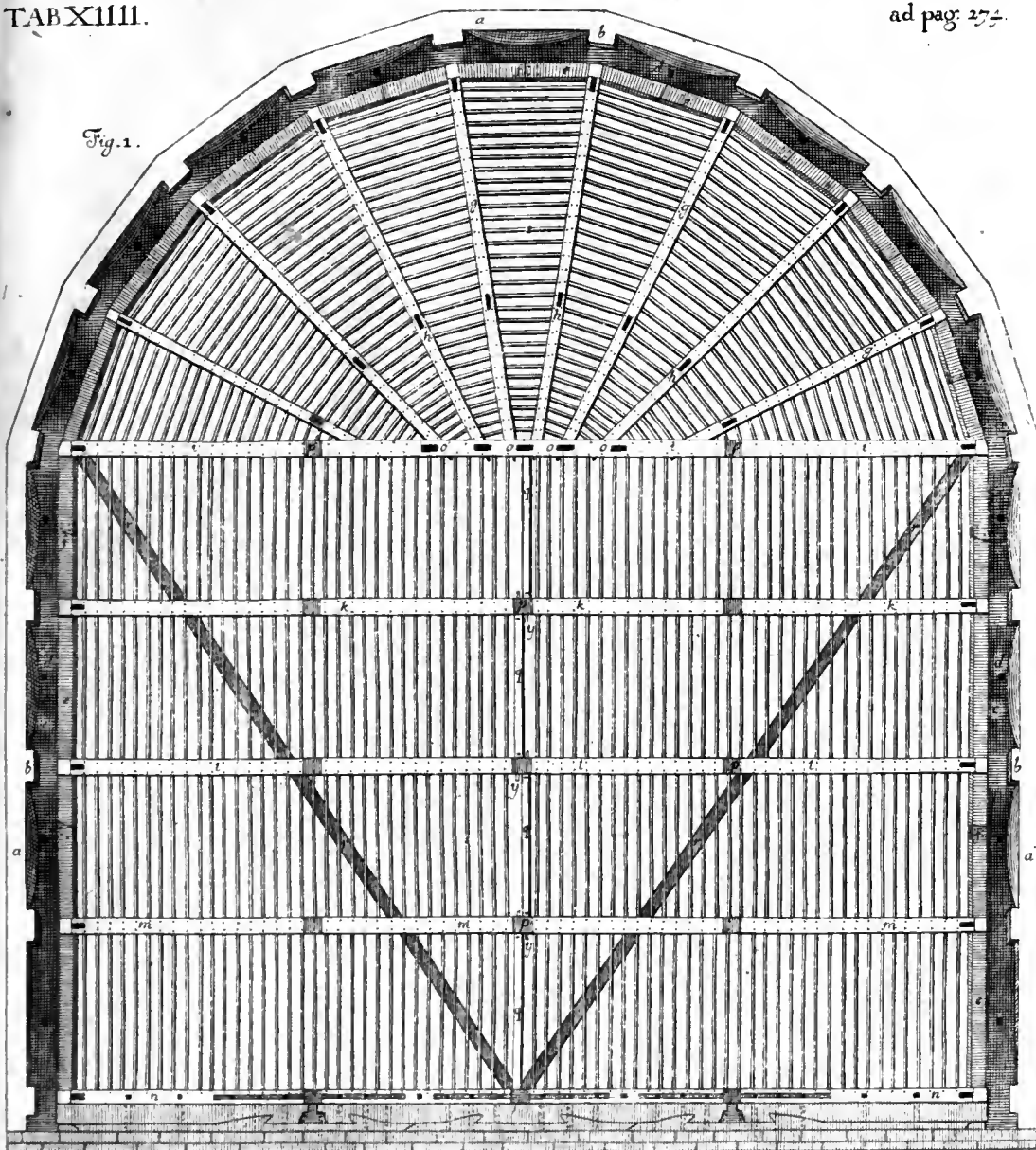
153. There are several other *roofs* in this *University* also well worth the noting, whereof some are *flat* or *under-pitched*, as the *roof* of the great *Hall* at *Christ Church College*, and the *roofs* of the *Chappels* and *Halls* at *Magdalen College* and *New College*; others *due proportion'd*, or *over-pitched*, such as at *Jesus*, *Wadham*, *Corpus Christi*, *Exeter*, and *Oriel Colleges*; which yet having nothing extraordinary either in their contrivance or workmanship, I pass them by, and proceed next,

154. To some remarkable pieces of *Painting* that we have here at *Oxon*; amongst which (to omit the *deformation* of a *Cæsars* head to be seen in the *Schools*, brought into shape by a *metalline Cylinder*, and several others of the kind at *Sir Anthony Copes*; and that *Painting* it self was first brought into *England* by *Venerable Bede* of this *University**) I take the *Painting* of the *Theater* to be well worth examination: for in imitation of the *Theaters* of the ancient *Greeks* and *Romans*, which were too large to be covered with *lead* or *tile*, so this by the *Painting* of the *flat roof* within, is represented open: and as they stretched a *cordage* from *Pilaster* to *Pilaster*, upon which they strained a covering of cloth, to protect the people from the injuries of the weather, so here is a *cord-molding* gilded, that reaches cross and cross the *house* both in length and breadth, which supporteth a great reddish *Drapery*, supposed to have covered the *roof*, but now furl'd up by the *Genii* round about the *House* toward the walls, which discovereth the open *Air*, and maketh way for the descent of the *Arts* and *Sciences*, that are congregated in a circle of clouds, to whose *assembly Truth* descends, as being solicited, and implored by them all.

155. For joy of this *Festival* some other *Genii* sport about the *Clouds*, with their *Festoons* of *Flowers* and *Lawrels*, and prepare their *garlands* of *Lawrels* and *Roses*, viz. *Honor* and *Pleasure* for the great *lovers* and *Students* of those *Arts*: and that this *assembly* might be perfectly happy, their great *enemies* and disturbers, *Envy*, *Rapin*, and *Brutality*, are by the *Genii* of their opposite *Vir- tues*, viz. *Prudence*, *Fortitude*, and *Eloquence*, driven from the *soci- ety*, and thrown down head-long from the *Clouds*: The report of the *assembly* of the one, and the expulsion of the other, being proclaimed through the open and serene *Air*, by some other of the *Genii*, who blowing their *antick Trumpets*, divide themselves into the several *Quarters* of the *World*. Hitherto in gross.

* Vid. Comment. in Carm:n. Phaleucium, Job. Seldeni, before Hoptons Concordance of Years.

Fig. 1.



A Scale of Feet

5 10 15 20 25 30

Fig. 2.

Fig. 3.

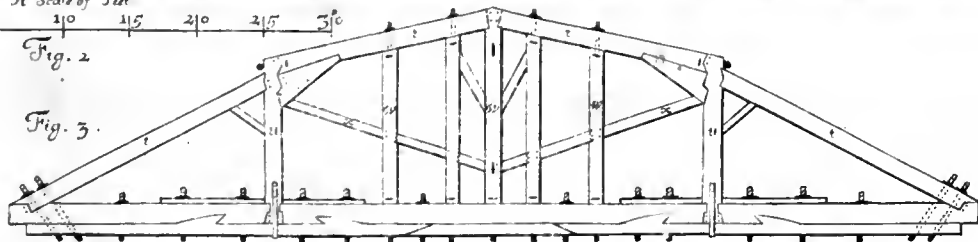


Fig. 4.

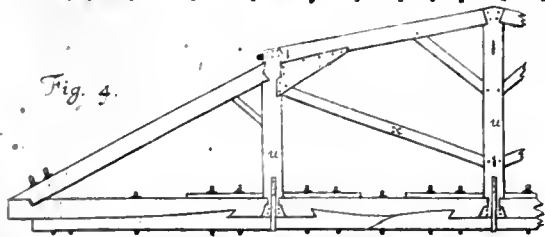
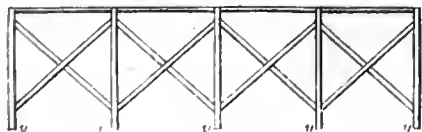


Fig. 5.



To the right Worsp.th
S. FRANCIS WENTWORTH K. & Bar.
 K. of the *SHIRE* in the p^{re}sent Parliam.
 This is a Table
 Shewing the Timberwork of the *TREASURY* with
 all due respect is humbly dedicated
 by *R. P. L. D.*

156. More particularly the *circle* of *Figures* consists first of *Theology*, with her Book with *seven seals*, imploring the assistance of *Truth* for the unfolding of it. On her left hand is the *Mosaical Law* veiled, with the *Tables of stone*, to which she points with her *Iron rod*. On her right hand is the *Gospel*, with the *Cross* in one hand, and a *Chalice* in the other. In the same division over the *Mosaical Law* is *History*, holding up her *Pen* as dedicating it to *Truth*, and an attending *Genius* with several *fragments* of old Writing, from which she collects her *History* into her Book: On the other side, near the *Gospel*, is *Divine Poesy* with her *Harp* of *David's* fashion.

157. In the *triangle* on the right hand of the *Gospel*, is also *Logick* in a posture of *arguing*; and in *another* on the left hand of the *Mosaical Law*, is *Musick* with her *antick Lyre*, having a *Pen* in her hand, and paper of *musick notes* on her knee, with a *Genius* on her right hand (a little within the partition of *Theology*) playing on a *flute*, being the *emblem* of the most ancient *musick*; and on the left (but within the partition for *Physick*) *Dramatick Poesy*, with a *vizor* representing *Comedy*, a *bloody dagger* for *Tragedy*, and the *reed pipe* for *Pastoral*.

158. In the *square* on the right side of the *Circle*, is *Law*, with her ruling *scepter*, accompanied with *Records*, *Patents*, and *Evidences* on the one side; and on the other with *Rhetorick*: by these is an attending *Genius* with the *scales of Justice*; and a *figure* with a *Palm branch*, the *emblem* of reward for *virtuous actions*; and the *Roman Fasces*, the marks of *Power* and *Punishment*. *Printing*, with a *Case of Letters* in one hand, and a *Form* ready set in the other, and by her several *sheets* hanging as a drying.

159. On the left side the *Circle* opposite to *Law* is *Physick*, holding the *knotty staff* of *Esculapius*, with a *serpent* winding about it: The *Botanist* imploring the assistance of *Truth* in the right understanding of the nature of her *Plants*: *Chymistry* with a *Retort* in her hands: and *Chyrurgery* preparing her self to finish the *dissecting* of a head, which hath the *brain* already opened, and held before her by one of the *Genii*.

160. On the other side of the *circle* opposite to *Theology*, in three *squares* are the *Mathematical sciences* (depending on *demonstration*, as the other on *Faith*) in the first of which is *Astronomy* with the *Celestial globe*, *Geography* with the *terrestrial*, together with

three attending *Genii* ; having *Arithmetick* in the *square* on one hand, with a paper of *figures* ; *Optick* with the *Perspective-glass* ; *Geometry* with a pair of *compasses* in her left, and a *Table* with *Geometrical figures* in it, in her right hand : And in the *square* on the other hand, *Architecture* embracing the *capitel* of a *column*, with *compasses*, and the *norma* or square lying by her ; and a *workman* holding another *square* in one hand and a *plumb-line* in the other.

161. In the midst of these *squares* and *triangles* (as descending from above) is the figure of *Truth* sitting on a *cloud*, in one hand holding a *Palm-branch* (the emblem of *Victory*) in the other the *Sun*, whose brightness enlightens the whole *circle* of *figures*, and is so bright, that it seems to hide the face of *her self* to the *spectators* below.

162. Over the *entrance* of the front of the *Theater* are three *figures* tumbling down ; first *Envy* with her *snaky hairs*, *squint eyes*, *hags breasts*, *pale venomous complexion*, *strong but ugly limbs*, and *ri-vel'd skin*, frighted from above by the sight of the shield of *Pallas*, with the *Gorgons* head in it, against which she opposes her *snaky tresses*, but her fall is so precipitous, that she has no command of her *arms*.

163. Then *Rapine* with her *fiery eyes*, *grinning teeth*, *sharp twangs*, her hands imbrewed in *blood*, holding a *bloody dagger* in one hand, in the other a *burning Flambeau*, with these *Instruments* threatening the destruction of *Learning*, and all its *habitations*, but is overcome and so prevented by a *Herculean Genius*, or *Power*. Next that is represented brutish scoffing *Ignorance*, endeavoring to vilifie and contemn what she understands not, which is charmed by a *Mercurial Genius* with his *Caduceus*. Which is the sum of what is designed by the *painting* of the *Theater*, for the most part thus described by *William Soper* M. A. of *Wadham College*, after of *Hart Hall*, only with some few additions and necessary alterations.

164. Beside the *painting* of the *Theater*, there are other *fine pieces* perhaps as well worthy notice, such are the *Resurrections* at *Magdalen* and *All-souls Colleges*, both of *Fullers* work ; though the latter indeed be somewhat defaced. The written *Picture* of his Majesty King *Charles* the first, in *St. Johns College Library*, taking up the whole Book of *Psalms* in the *English* tongue ; and the written *Picture* of King *James*, and the *Arms* of *England* (as now born) taking up the whole Book of *Psalms* in the *Latin*, in the hands

hands of Mr. Moorhead Rector of Bucknel, are pretty curiosities, and much admired.

165. And so is the *Cat* painted over one of the *compartments* including the *Arms* of the *University*, in the South side of the *gallery* at the *Schools*, for her looking directly upon all her *Beholders*, on what side soever they place themselves; which common, yet surprizing effect of the *Painters* Art, is caused, says the ingenious *Honoratus Faber* ^x, in all *Pictures* whatever of this nature, by their turning the *nose* to one side and the *eyes* to the other; whence it comes to pass that such *Pictures* seem to look to the right side, because indeed the *eyes* are turned that way; and to the left in like manner, because the point of the *nose* is turned to the left: where by the way he also notes, that 'tis necessary that all such *pictures* be drawn on *flat tables*, so that the *Beholder* perceive not that the *eyes* of the *picture* are turned contrary to the *nose*; which he must needs do if the *eyes* of the portrait were *convex*, concluding, that no *figure* can be made in *Rilievo* thus to look every way.

166. To this place also belongs the *Invention* of drawing *pictures* by *Microscopical glasses* by Sir *Christopher Wren* ^y, and the *Invention* of Mr. Bird Stone-Cutter or Carver of *Oxford*, of sinking a *colour* a considerable depth into the body of polish'd *white marble*, by application of it to the out-side only, so that the same *Figures* delineated without, shall be as perfectly represented within, deeper or shallower, according as he continues his application to the surface a longer or shorter while ^z. And if we may take in *Etching*, which is *painting* in *Copper*, there is a very curious and speedy way also *invented*, by the so often mentioned Sir *Christopher Wren* ^a. And which borders still on these, in the *Statuaries* Trade, we can shew two excellent *pieces* of *Art*, in the *Statues* of *Brafs* of King *Charles* the first, and his *Queen Henrietta*, placed in the *Niches* over the gates of the new *Quadrangle* in Saint *John Baptist College Oxon*.

167. In some other Trades yet inferior to these, there have been made also considerable *Inventions* and *Improvements*, such as that of weaving *silk stockings*, first invented by one Mr. *William Lee* M. A. of this *University*, who being married and poor, and observing how much pains his *Wife* took in knitting a pair of *stock-*

^x *Honorati Fabri Tract. de Homine, Lib. 2. prop. 93. sub finem.* ^y *History of the Royal Society, Part. 2. sub finem.* ^z *Philosoph. Transact. Numb. 7.* ^a *Hist. of the Royal Society, Part. 2. sub finem.*

ings, put himself on thinking of a nearer way : whereupon having observed the contrivance of the *stitches* by unravelling a *Stocking*, he designed a *Loom* accordingly, which succeeded so well, that (with but small alteration) it remains the same to this very day.

168. And 'tis confidently vouched, that the *Engine* for cutting of *handles* of *Knives*, we commonly buy cut into those various *figures*, was first *invented* and practiced here in *Oxford* by *Thomas Pierce* a Cutler, whose *Apprentice* now practices the same *Art* in *London* : But not with so much accuracy as *Robert Alder* another Cutler of *Oxford*, who only by observance of the others work, and long study, at last found it out also, and hath improved it much : which two last, as I am informed, are the only two *persons* that can do this in *England*, perhaps I may say it^h *World*. Nor can I pass by the *Invention* in the *Coopers Trade*, of making *barrels* without hoops, whereof I found a *specimen* in *St. Ebbs Parish Oxon.* though I know the *Invention* belongs to another place, of which more when I come thither.

169. For *Improvements*, 'tis certain that the *Blanketing trade* of *Witney* is advanced to that height that no *place* comes near it ; some I know attribute a great part of the excellency of these *Blankets* to the *abstersive nitrous water* of the River *Windrush* where-with they are scoured, as was mentioned before, *cap. 2. §. 12.* but others there are again that rather think they owe it to a peculiar way of *loose spinning* the *people* have hereabout, perhaps they may both concur to it : However it be, 'tis plain they are esteemed so far beyond all *others*, that this place has engrossed the whole *trade* of the *Nation* for this *Commodity* ; in so much that the *wool* fit for their use, which is chiefly *fell wooll* (off from *Sheep-skins*) centers here from some of the furthest parts of the *Kingdom*, *viz.* from *Rumney-marsh, Canterbury, Colchester, Norwich, Exeter, Leicester, Northampton, Coventry, Huntington, &c.* of which the *Blanketers*, whereof there are at least threescore in this *Town*, that amongst them have at least 150 *Looms*, employing near 3000 poor people, from *children* of eight years old, to decrepit *old age*, do work out above a hundred packs of *wool* per week.

170. This *Fell wooll* they separate into five or six sorts, *viz.* *long fell wooll, head wooll, baywool, ordinary, middle, and tail wooll* : *Long fell wooll* they send to *Wells, Taunton, Tiverton, &c.* for making

king worsted stockings; of head wool and bay wool, they make the blankets of 12, 11, and 10 quarters broad, and sometimes send it, if it bear a good price, to *Kedderminster* for making their Stuffs; and to *Evesham*, *Parshore*, &c. for making yarn stockings; or into *Essex* for making Bays, whence one sort of them I suppose is called bay wool: of the ordinary and middle they make blankets of 8 and 7 quarters broad; and of these mixt with the courser locks of fleece wooll, a sort of stuff they call *Duffields* (which if finer than ordinary, they make too of fleece wooll) of which *Duffields* and blankets consists the chief Trade of *Witney*.

171. These *Duffields*, so called from a Town in *Brabant*, where the trade of them first began (whence it came to *Colchester*, *Braintry*, &c. and so to *Witney*) otherwise called *sbags*, and by the Merchants, trucking cloth; they make in pieces of about 30 yards long, and one yard $\frac{3}{4}$ broad, and dye them red or blue, which are the colours best please the *Indians* of *Virginia* and *New England*, with whom the Merchants truck them for *Bever*, and other *Furs* of several Beasts, &c. the use they have for them is to apparel themselves with them, their manner being to tear them into gowns of about two yards long, thrusting their arms through two holes made for that purpose, and so wrapping the rest about them as we our loose Coats. Our Merchants have abused them for many years with so false colours, that they will not hold their gloss above a months wear; but there is an ingenious person of *Witney* that has improved them much of late, by fixing upon them a true blue dye, having an eye of red, whereof as soon as the *Indians* shall be made sensible, and the disturbances now amongst them over, no doubt the trade in those will be much advanced again.

172. Of their best tail wooll they make the blankets of 6 quarters broad, commonly called cuts, which serve Sea-men for their Hammocs, and of their worst they make *Wednel* for Collar-makers, wrappers to pack their blankets in, and tilt-cloths for Barge-men. They send all the sorts of *Duffields* and Blankets weekly in waggons up to *London*, which return laden with fell wooll from *Leaden-hall*, and *Barnaby-street* in *Southwark*, whether 'tis brought for this purpose from most places above-mention'd; *Oxford-shire* and the adjacent Counties being not able to supply them.

173. There are also in this Town a great many Fell-mongers, out of whom at the neighboring Town of *Bampton*, there arises

another considerable *trade*, the *Fell-mongers* *sheep-skins*, after *dressed* and *strained*, being here made into *wares*, viz. *Jackets*, *Breeches*, *Leather linings*, &c. which they chiefly vent into *Berkshire*, *Wiltshire*, and *Dorsetshire*, no *Town* in *England* having a *trade* like it in that sort of *ware*.

174. Which two trades of the *Towns* of *Witney* and *Bampton*, are the most *eminent*, that are too, the most *peculiar* of this *County*. The *Mauling trade* of *Oxford* and *Henly* on *Thames*, 'tis true are considerable, and *Burford* has been famous time out of mind for the making of *Saddles*; and so has *Oxford* had the reputation of the best *Gloves* and *Knives*, of any place in *England*; but these *trades* being not *peculiar* to the places where they are practised, I therefore pass them by without further notice.

175. But the *Starch trade* of *Oxford*, though indeed it be not great, yet being practised in few places, and the *method* known to fewer how it is made, its discovery perhaps may be acceptable to some, I shall not therefore stick to give a short account of it. Let them know therefore, that the substance we commonly call *Starch*, notwithstanding its pure *whiteness*, is made of the shortest and worst *bran* that they make in the *Meal shops*, worse than that they sell to *Carriers* to feed their *Horses*; This they steep in a *water* prepared for that purpose (by a solution at first of *Roch-Alum*, about a pound to a *Hogshead*, which will last for ever after) for ten or fourteen days in great *tubs*; then 'tis taken and *washed* through a large *Oser basket* over three other *tubs*, the *sower water* of the *second tub* washing it into the *first*; and the *sower water* of the *third*, into the *second*; and clear water from the *Pump* washing it into the *third*.

176. Where by the way it must be noted, that only *Pump water* will serve the turn to give it this last *washing*, and continue the waters *sowerness* for ever after, by reason I suppose of the incisive particles of *salt* to be found in most *Pump waters* (which are plain from their not taking *soap*) that are apt to work upon and separate the finest *flower* yet sticking to the *bran* (notwithstanding the *mill* and *sieve*) which at last becomes *starch*.

177. What remains in the *basket* at last after the three *washings*, is thrown upon the dung-hill, which, as they have found of late, becomes a very good *manure* for *meddow land*, and should therefore have been mentioned in the 70 §. of this *Chapter*, amongst the

the *uncommon manures*. And the fine *flower* thus washed from the *bran*, is let stand again in its own *water* for about a week, then being all settled at the bottom, it is stirred up again and fresh *Pump water* added, and strained from its smallest *bran* through a *Lawn sieve*; which done, they permit it to settle again, which it does in one day, and then they draw off the *water* from it all to a small matter: then standing two days more, it at last becomes so fixt, that with a burchen *broom* they sweep the water left at the top, (which is a slimy kind of matter) up and down upon it to cleanse it from filth, and then pouring it off, they wash its surface yet cleaner, by dashing upon it a bucket of fair *Pump water*.

178. Which done, they then cut it out of the *tubs* in great pieces with sharp *trowels*, and box it up in *troughs*, having holes in the bottom to drain the *water* from it, always putting wet *cloths* between the wood and it, for the more commodious taking it out of the *troughs* again to dry, which they do within a day; laying it first on cold *bricks* for about two days, which suck away a great deal of *moisture* from it, and after over a *Bakers oven* four or five days together, which will dry it sufficiently, if intended only to be ground to *powder* for *hair*, as it is chiefly here; but if intended to be sold as *starch*, they then use a *stove* to give it the *starch grain*, which the oven will not do.

179. From the *inferior*, I proceed to the *superior Arts and Sciences*, and others *instrumental* to them, for in these too, there have been many *Inventions* and *Improvements* made in this *University*. In enumeration whereof, if we begin so low as the very *Elements* of *Speech*, we shall find that the Reverend and Learned Dr. Wallis, *Savilian Professor* of *Geometry* here, first observed and discovered the *Physical* or *Mechanical* formation of all *sounds* in *Speech*, as plainly appears from his *Treatise de Loquela*, prefix'd to his *Grammar* for the *English Tongue*, first publish'd in the Year 1653.

180. In pursuance whereof, he also found out a way whereby he hath taught *dumb persons* (who were therefore *dumb* because *deaf*) not only to understand what they *read*, and by *writing* to express their minds, but also to *speak* and *read* intelligibly, according to directions for the artificial position and motion of the *Organs* of *Speech*, and thereby also assisted others who have spoken very imperfectly. Of which no more, there being a particular

account given by *himself* in our *English Philosophical Transactions*, of July 18. 1670^b.

181. I know that the Right Reverend Father in God *John Wilkins*, late Lord Bishop of *Chester*, hath also laid down the distinct manner of forming all *sounds* in *Speech*, and shewed in *Sculpture* which *letters* are *Labial*, *Lingual*, *Nasal*, &c. and how the *Epiglottis*, *Larynx*, *Astera Arteria*, and *Oesophagus*, conduce to them. Since *him*, in the Year 1669. the Reverend and Ingenious *William Holder* D.D. publish'd an *Essay* of Inquiry into the Natural Production of *Letters*, together with an *Appendix* to instruct persons *deaf* and *dumb*^c. Yet whether either of these, with advantage of what *Dr. Wallis* did before, have with more accuracy of judgment performed the same, I dare not by any means take upon me to determine.

182. The same *Dr. Wallis* hath also, with great sagacity, deciphered many things written in *Cyphers*, of very intricate and perplexed contrivance, beyond what hath been known to have been done by any other, whereof there be *Examples* of many in a *MS. Book* of his, reserved in the *Archives* of the *Bodleian Library*.

183. Add hereunto the ingenious *Invention* of a *Universal Character*, or *Philosophical Language*, first contrived here at *Oxford* by *Mr. George Dalgarno* M. A, who in the Year 1656. endeavoring to improve the *Art* of *Short-hand* beyond what others had done, by expressing the *auxiliary Particles* of the *English* Language, by distinct *points* and *places* about the *radical* or *integral* words, after the manner that 'tis done by *prefixes* and *suffixes* in the *Hebrew*; found at last that there was no way to distinguish the *affixed points* which he intended to be used *really*, from those used before in the common way of *Short-hand* (where not only the *Capital Character*, but *points* about it were *Alphabetical*) but by making the *principal Character* it self, to which they were to be accessory, not *Alphabetical* but *real*.

184. Thus having formed *Tables* both of *Integrals* and *Particles*, to be expressed by single *Characters*, he perceived at length, that he was gone unawares further than ever he intended, having not only improved the *Art* of *Short-hand*, but also discovered a *real Character* equally applicable to all *Languages*: And after he

^b Philosoph. Transact. Numb. 61. ^c Philosoph. Transact. Numb. 47.

had pursued the design of a *dumb Character* a considerable time, at last he perceived that it would naturally resolve it self into a *Language*, having this advantage over any *Character*, that we may use our known *Alphabet* to express it, whereas in a *Character* the *figures* must be new. At length having digested his whole contrivance into a *Synopsis*, he communicated it to several *Learned Men*, whose approbation and certificates procured him good encouragement; but he met with no *Man* that took so much pains to understand the *Novelty*, or so zealous to have it finished and come abroad, as the Reverend and Learned Dr. *John Wilkins* late Lord Bishop of *Chester*, then the worthy Warden of *Wadham College*.

185. The last thing he attempted in his *Tables*, was the reducing the *species* of Natural Bodies to the rules of *Art*, the reason of which delay, was because he perceived that they occurred but seldom in common discourse, and that there was but little *Grammatical* difficulty about them, though in number they much excelled all the other *simple notions*, which make the body of a *Language*: His judgment then being, and as far as I can perceive, still remaining unshaken, notwithstanding what has been done since, that from a few *general words* allowed to be *radical*, the names of the *inferior species* should be made off by *composition*, adding to the *general* and *radical* word, one, or sometimes more such words taken from the Table of *Accidents* as might describe the intended *species*, and difference it from all *others*, and sometimes also to allow *Periphrases*.

186. And this *Institution*, as he takes it to be grounded upon *nature* and *necessity*, as appears more or less in all *Languages*, so he thinks it approved by the highest *Examples* that ever *Art* was: For God Himself named the first *Man*, though a single *Individual*, not by a word of a *first*, but *second institution*; and *Adam* as a perfect *Philosopher* imitating his *Maker*, named all living *Creatures* not by words of a *first institution*, antecedently insignificant, but by such as by an *antecedent institution*, might be apt to express something of their *nature*, for otherwise the common opinion of *Divines* that *Adam* gave names to the *Creatures* according to their *natures*, would be absurd.

187. Which *Institution* he takes also to have this further *advantage*, that the name of any single *species* may be known with-

out obliging the Learner to carry in his memory all the *Predicamental Series* of its fellow *Species*; so that *names* of common use may be known, passing by *others* that are not so, which to *Learners* is as great an encouragement, as the obtruding things not necessary is a discouragement to them. According to this *Institution*, he published a *Specimen* called *Ars Signorum*, in the Year 1660. containing but 500 *Radicals*, all the *Particles* being brought from the *Radicals* by which they are resolved; every *Radical*, except the *genera intermedia* being *Monosyllables*, and all things else being made off from *these* by *composition*, which is allowed here in its fullest latitude, *Quidlibet cum quolibet pro re nata*, provided the *simple terms* loose nor change nothing of signification, by *composition*.

188. But the Reverend and Learned Dr. *John Wilkins*, who thoroughly understood and commended his *labors* in the former part of the *work*, thinking perhaps that this way of *composition* would produce *too long* words, or that the various *conceptions* of *Men*, must needs cause different *compositions* and *descriptions* of the same *things*, and thence unavoidably bring misunderstandings (which yet Mr. *Dalgarno* thought might be avoided by stating of *notions* and a collection of *Formula's*) did not approve of this *Institution*; declaring his judgment to be, that all the *species* of *Natural Bodies* (according as he owns, was suggested to him by that most learned and excellent person Dr. *Seth Ward*, the present Bishop of *Salisbury* *) ought to be provided for as *Radicals*, by a regular enumeration of them according to the *Theories* of the *Schools*.

189. Nor did he approve of his rejection of a *Character*, since a graceful one might be contrived more proper for *Brachygraphy*, and equally convenient for many *Nations*, with the common *Alphabet*: Nor of his bringing the *Particles* from the *Radicals* by which they are resolved; judging perhaps their *composition*, beside the reducing some of them handsomely, more troublesome than that, of learning a *small*, yet *sufficient* number of them disposed regularly in *schemes*, and noted with smaller *Characters* than those of *Integrals*. All which may be collected from the learned *Essay* towards a real *Character*, or *Philosophical Language*, put forth by that highly ingenious person then Dean of *Rippon*, *An.* 1668.

* *Essay towards a Real Character*, in the Epistle to the Reader.

190. In which, though 'tis true the number of *Radicals* are near 3000, yet are they so ordered by the help of a *natural method*, that they may be more easily learned and remembred than 1000 words otherwise disposed of, upon which account they may be reckoned but as 1000. For the *Signa* (they are so methodically contrived) they may be all learned in less than an hour, were they twice as many; the difficulty therefore must be in the *signata*, but these being drawn up in *schemes*, so that one notion will clearly depend upon another, they seem to be a perfect *artificial memory*, rather than require any help to be remembred. Notwithstanding it leaves a large scope, enough for *derivation* and *composition*, as may be seen by the *Tables*, where several words, though no *Synonoma's* to it, may be made off from a *Primitive*, as *Queen*, *Crown*, *Scepter*, *Throne*, from the *Radical* [*King*]; and so from the *Primitive*, [*sheep*] are made off, *ram*, *ewe*, *lamb*, *weather*, *mutton*, *bleat*, *fold*, *flock*, *shepherd*, &c. which compositions are clear, though the greatest difficulty of the *Language* consists in these.

191. Yet I shall not offer to determine which of these is to be preferr'd, leaving that wholly to the *Readers* judgment, who may consult both *Treatises*: It being sufficient for me, that a *Universal Character* and *Philosophical Language* can be no more reckoned amongst the *Desiderata* of Learning, and that the defect was first supplied here at *Oxford*; the Contrivances of *both* being first founded *here*, and both grounded upon rational and solid principles, with greater advantages of facility, than can be believed possible to any that have not made tryal. And this is all concerning *Letters* and *Language*, but that *John Basin* also an *Oxford man*, *Figuras Græcorum numerales in Angliam portavit, & earum notitiam suis familiaribus significavit, de quibus figuris hoc maxime admirandum, quod unicâ figurâ quilibet numerus significatur, quod non est in Latino vel in Algorismo*^d.

192. In *Logick* the subtle *Johannes Duns Scotus*, Fellow of *Merton College*, was the *Father* of the Sect of the *Reals*; and his Scholar ^e *Gulielmus Occham*, sometimes falsely printed *Holran*, of the same *House*, *Father* of the Sect of the *Nominals*, betwixt whom as the story goes, there falling out a hot Dispute (*Scotus* being then *Dean* of the *College*, and *Occham* a *Bachelor Fellow*) where-

^d Matth. Paris, *Hist. Angl. in Anno* 1252. pag. 835. Edit. Watfiana. ^e Vid. *Johannis Lelandi collectionanea de Viris Illustribus*.

in though the *latter* is said to have obtained the better, yet being but an *inferior*, at parting submitted himself with the rest of the *Bachelors* to the *Dean* in this form, *Domine quid faciemus*, as it were begging punishment for their boldness in *arguing*; to whom *Scotus* returning this answer, *Ite, & facite quid vultis*. They forthwith brake open the *Buttery* and *Kitchen* doors, taking all they could meet with, making merry with it all night: Which, 'tis said, gave occasion to their observing the same *diversion* to this very day, whenever the *Dean* keeps the *Bachelors* at *Disputations* till twelve at night, which they now commonly call a *Black night*.

193. *Rogerus Swisset*, alias *Swinthead*, of the same *College*, was the first Contriver of the *Art Calculatory* in *disputation*, wherein says the Learned *Selden*, *Multiplicatis particulis negativis & trajectis per esse, & non esse, Calculo* (which was *Beans* and *Peas*) *opus erat, quoties erat disputandum* *. But others who have consulted more of his *Works* than I suppose Mr. *Selden* ever did, rather think this *Art Calculatory*, to be some way he had to determine the *proportions* of matters capable of *proportion* or *degrees*, such as *action*, *motion*, *reaction*, *intension*, *remission*, &c. whereof the *Reader*, if he think it worth while, may further satisfy himself from his Printed Works; such as his *Introductorium in Calculationem*, his *Calculationes cum Quæst. de Reactione*, his Treatises *de intensione & remissione, maximo & minimo*; to which add, *M. Bassani Politi, Introductorium in Calculationes Swisset*, most of which, if not all, are in *Merton College Library*.

194. The same *Roger Swisset* found out many things in *Mathematicks*, which no body found before him, & *perpauci post eum jam Inventa comprehendere valuerunt*, says *Pitseus* of him †. And the Honorable *Robert Dudley* of *Christ Church College Oxon* (made *Duke* by the *Emperor* ‡, with the Title of *Northumberland* here in *England*, whereof he fancied himself wrongfully deprived) contrived many *Engines* and *Mathematical Instruments* not known before, now in the possession of the *Great Duke of Tuscany*, to whose *Ancestors* he applied himself in his discontent, by whom he was succor'd and highly valued for his great *Learning*, and with whom his *Children* now remain to this day in *Wealth* and *Honor*, retain-

* Vid. *Comment. in Carmen Phalæcium, Joh. Seldeni*, before *Hoptons Concordance of Years*. † Vid. *Pitsei Relationes Hist. de rebus Angl. præsertim de Scriptoribus in An. 1350.* ‡ *Hist. & Antiquitates Universitatis Oxon. per Anthonium à Wood, lib. 2 pag. 275.*

ing the Titles of *Dukes of Northumberland* and *Earls of Warwick and Leicester*; which Titles others say, and perhaps more rightly too, were conferred on them by the *Pope*, in whose Quarrel they were pretended at least to have been lost^h.

195. Of later years the highly ingenious Sir *Christopher Wren*, in the year 1668. first found out a *straight line* equal to a *Cycloid* and the parts thereof, as is clearly made appear in his behalf by the Right Honorable and Learned, the Lord Viscount *Brouncker*, Chancellor to Her Majesty, and *President* of the *Royal Society*; and the Reverend and Learned Dr. *John Wallis*ⁱ. The same Right Worshipful and very learned Person Sir *Christopher Wren*, found out also several new *Geometrical Bodies*, that arise by the application of two *Cylinders* and one *Lenticular Body*, fit for grinding one another; by whose mutual *attrition* will necessarily be produced a *Conoides Hyperbolicum*, and two *Cylindroidea Hyperbolica*: The *Engine* whereby this may be done being represented in *Sculpture* in our *Philosophical Transactions*, and designed for grinding *Hyperbolic glasses*^k. He also first observed that a *plain straight edged Chisel*, set any way obliquely to a *Cylinder* of wood, did necessarily torn it into a *Cylindroides Hyperbolicum Convexo-concavum*, the several *sections* whereof are accurately demonstrated by the Reverend and Learned Dr. *John Wallis* our English *Archimedes*^l.

196. The same Dr. *John Wallis*, *Savilian* Professor of *Geometry* in this *University*, in the year 1656. published his new *method* called his *Arithmetick of Infinites*, for the more expedite and effectual enquiry into the *Quadrature* of *Curvilinear* figures, or other difficult *Problems* in *Geometry*; and therein, amongst other things (at the *Scholium* of his 38 *Proposition*) shewd the way of comparing *straight* and *crooked* lines, which gave occasion to Mr. *William Neil* (in pursuance thereof) in the year 1657. to find out (the first of any Man) a *straight line* equal to a *Curve*, of which we have an account in the *Philosophical Transactions* of Novemb. 17. 1673^m.

197. The same Reverend and Learned Dr. *John Wallis*, amongst his other numerous and new Performances in *Arithmetick* and *Geometry*, first demonstrated the impossibility of squaring the *Circle*, *Arithmetically*, according to any way of *notation* yet ge-

^h Ex Itinerario Joh. Bargrave S. T. P. & Præbend. Ecclesiæ Christi Cant. MS penes seipsum. ⁱ Philosoph. Transact. Numb. 98. ^k Ibid. Numb. 52. ^l Wallisii Mechanica, sive de Motu, part. 2 de Calculo Centri gravitatis, cap. 5. Prop. 32. ^m Philosoph. Transact. Num. 98.

nerally received^a, and what kind of new *notation* must be introduced to express it, with divers *methods* of *squaring* the *Circle*, *Ellipsis*, and *Hyperbole*, so far as the nature of *Numbers* will bear; having apply'd his *method* of *Infinities* in order thereunto; as also for rectifying of *Curve-lines*, plaining of *Curve-surfaces*, squaring of innumerable sorts of *Curve-lined* figures, plain and solid (amongst which are a multitude of *figures* of *infinite* length, and *finite* content) determining their *Centers* of *Gravity*, and other *accidents*.

198. He has also adjusted the strength of *percussions* and *reflexions* (or *repercussions*) and other motions to *Geometrical* measures, deduced from principles of *Elasticity*; and has estimated the *artificial* force acquired in all sorts of *Mechanick* *Engins*, deduced from our common principle of the *Reciprocation* of *Strength* and *time*; with many other improvements of *Aritbmectick*, *Algebra*, *Geometry*, *Mechanicks*, and other parts of *Mathematicks*, in his *Aritbmectick* of *Infinities*, his *Treatise* of the *Cycloid*, with that adjoyned of the *rectification* of *Curves*; his *Treatise* of *Motion*, and other his *Printed Works*.

199. In *Musick* (which is *Aritbmectick* adorned with *sounds*) to pass by a *Harpsechord* that I met with at Sir *Tho. Penystons* with *Cats-gut* strings. It hath been lately observed here at *Oxford*, that though *Viol* or *Lute* strings rightly tuned do affect one another, yet most of them do it not in all places alike, as has till now been supposed: for if the lesser of two *Octaves* be touched with the hand or bow, each half of the greater will answer it, but will stand still in the *middle*; and if the greater of the two *Octaves* be touched on either of its *halves*, all the lesser will answer it, but if touched on the *middle*, the lesser will not stir any where at all. So if the lesser string of two *fifths* be touched on either of its *halves*, each *third* part of the greater will answer it, but if on the *middle* they will not stir; and if the greater of two *fifths* be touched on either of its *thirds*, each *half* of the lesser will answer it, but if in the *divisions* they will not stir: and so of *twelfths*, *fifteenths*, &c.

200. Which *Phænomena* I shall always gratefully acknowledge were first discovered to me by the ingenious *Thomas Pigot* B. A. and Fellow of *Wadham College*, which have also been observed for about these two years, by the no less ingenious *William Noble* M. A.

^a Vid. *Aritbmcticam Infinitorum*, Prop. 192. cum Scholio sequ.

of *Merton College*: The solution whereof in all their *Cases*, as received from the learned and accurate hand of the Reverend *Narcissus Marsh* D. D. and Principal of *St. Alban Hall*, one of the most cordial *Encouragers* of this *Design*, take as followeth: which though so exquisitely done, that it seems not capable of much addition or amendment, yet he modestly will have called but a short *Essay* touching the (esteemed) *Sympathy* between *Lute* or *Viol* strings.

201. Wherein he first lays it down as a *Postulatum*, that if two *Lute* or *Viol* strings be rightly tuned, the one being touched with the hand or bow, the other will *answer*, or tremble at its motion, which holds also in some measure in *Wire strings*; and between *Organ pipes* and *Viol strings*, but not between *Wire* and *Viol strings*. For the clearer solution of which *Phænomenon* in all its *cases*, he has laid down these two following *Principles*.

Princip. 1. *That strings which are Unisons are of the same, or a proportionable length, bigness, and tension; so that by how much any string is longer than other, ceteris paribus, by so much smaller, or more tended; and by how much bigger, by so much shorter or more tended must it be, to render them Unisons, w^{ch}* will appear in the following *Cases*. Whereunto he premiseth,

That in *strings* moved by an equal force, through a like medium, the difference of motion does arise from the difference of magnitude and tension, wherefore (the force and medium being alike) he

- Premiseth 1. That *strings* of the same cize move equally fast, because they cut the *Air* with the same facility. Hence
2. That the greater any *string* is in diameter (or circumference) the slower it moves (and on the contrary) because it finds the greater resistance in the *Air*.
 3. That *strings* of the same length and tension move to the same distance, because they have the same compass to play. Hence
 4. That the longer, or less tended, any *string* is, the farther it moves (and on the contrary) because of the greater compass it can fetch.

Whence he infers this Conclusion,

That (in *strings* moved through the same medium) the swiftness of motion does arise from the greater force, and less cize or bigness; the compass of vibration, from the greater length (or force) and

less tension; and the quickness or frequency of vibration, from the greater or swifter motion, and less compass.

202. This premised, he proceeds to his first Hypothesis, and shews, that if AB and CD , *Tab. 15. Fig. 1.* be equal in length, as in *Viol strings*, what sounds and vibrations they will produce according to their different bigness and tension in the following Cases.

Cas. 1. Let $AB =$ (i. e. be equal to) CD , *Tab. 15. Fig. 1.* have the same size and tension, and be touched with an equal force, they will vibrate to equal distances $EG = IK$ (per præmissam 3) in the same time (per præm. 1.) whereby striking the Air into alike arches, or arches of equal circles, with the same briskness, and alike quick or frequent returns of their vibrations, they will produce the same sound, and so be unisons, 1 to 1 vibration.

Cas. 2. Let $AB = CD$, *Fig. 1.* have the same size and a greater tension, 'twill with the same force, vibrate proportionably to a less distance (per præmis. 4.) in a shorter time (per præm. 1.) as, if double the tension, to half the distance $EF = \frac{1}{2} EG$ or IK , in half the time; striking the air into an arch of a greater circle (and that so much the greater, as AB is a chord of fewer degrees to AGB , the less) which doing brisk and smartly with a quick return, because of the little compass it fetches, 'twill beget a sound so much the more acute, as its vibrations (are shorter, and thereby) come thicker and oftner; i. e. of double the acuteness, or an upper octave to CD 2 to 1 vibration.

Cas. 3. Let $AB = CD$, *Tab. 15. Fig. 2.* have a greater size and the same tension, it will with the same force, vibrate to the same distance $EG = IK$ (per præm. 3.) but in a longer time proportionably (per præm. 2.) as, if it be double in diameter (and so in circumference, i. e. quadruple in bulk) in twice the time; striking a Note so much the more grave, as its vibrations return slower and seldomer, and are thereby fewer, i. e. twice as grave, or an under octave to CD , 1 to 2 vibrations.

Cas. 4. Let $AB = CD$ *Fig. 2.* have as much greater a size as tension, it will, with an equal force, vibrate to a less distance pro-

proportionably ; as if double the *cize* and *tension*, to half the *distance* $EF = \frac{1}{2} EG$ or IK in the same *time* (per *Cas.* 2. & 3.) and so keeping touch in their *vibrations*, they will strike *unisons* 1 to 1 *vibration*.

Cas. 5. Let $AB = CD$ *Fig.* 2. have as much greater *cize* as less *tension*, 'twill with the same force *vibrate* to a greater *distance* proportionably, in a time greater in a duplicat *proportion* ; as if double the *cize*, and but half the *tension*, to double the *distance* $EH = 2 EG$ or IK , in quadruple the *time* (per *Cas.* 2. & 3.) and so will strike an under *disdiapason* or 15^{th} to CD , 1 to 4 *vibrations* ; as on the contrary CD to AB an upper, 4 to 1 *vibr.*

Where by the way he gives notice, that when he speaks of *strings* (of a different *cize*) being moved by the same or an equal force (which is also to be understood in all the following *cases* where not exprest) that he means it that way their *gravity* does propend, viz. downward in those that are *Horizontally* streined, lest their proper *gravity* might be thought to cause a difference.

203. Thus having absolved his first *Hypothesis* concerning *strings* of equal length, he proceeds to his second, and shews that if AB and CD , *Fig.* 3. be unequal in *length*, as in most *Lute-strings*, what *vibrations* and *sounds* they will produce, according to their different *cizes* and *tension* also in the following *Cases*.

Cas. 1. Let $AB > (i. e. \text{ be longer than }) CD$, *Tab.* 15. *Fig.* 3. have the same *cize* and *tension*, it will with an equal force, *vibrate* proportionably to a greater *distance* (per *præm.* 4.) in a greater time (per *præm.* 1.) as if twice as long to double the *distance*, $LN = 2 LM$: For $AL. LN :: GL. LM.$ (& $AN. CM :: NL. ML.$ [per 4. 6. *Euc.*] ergo *Arch.* $AN = \text{Arc. } CMD$) and that in twice the time ; striking the *air* into an *arch* of a circle of double the *Radius* ; by which double slower return of its *vibrations*, 'twill produce a sound twice as grave, or an under *octave* to CD . 1 to 2 *vibrations*.

Cas. 2. Let $AB > CD$ *Fig.* 3. have the same *cize*, and a *tension* as much greater as 'tis longer, 'twill with an equal force, *vibrate* to the same *distance* LM (per *præm.* 4. vel per *Cas.* 1. *Hyp.* 2. & *Cas.* 2. *Hyp.* 1.) in the same time (per *præm.* 1.) striking the *air* (with alike briskness) into an *arch* of a circle, so

much greater proportionably, as CD is the *chord* of fewer *degrees*, and so will produce alike sounds or *unisons*. 1 to 1 *vibration*.

Cas. 3. Let $AB > CD$, *Fig. 3.* have the same *cize* and a *tension* as much *less*, as 'tis *longer*; 'twill *vibrate* to a *distance*, and in a *time* greater in a duplicate proportion (*per præm. 4. & 1. vel per Cas. 1. Hyp. 2. & Cas. 2. Hyp. 1.*) as, if being double, it has but half the *tension* to quadruple the *distance* $LO = 4 LM$ in quadruple the *time*, and so will produce a sound 4 times as *grave*, or an under *disdiapason* to CD 1 to 4 *vibr.*

Cas. 4. Let $AB > CD$, *Tab. 15. Fig. 4.* have a *cize* as much greater as 'tis *longer*, and the same *tension*. 'twill *vibrate* to a greater *distance* proportionably (*per præm. 4. vel per Cas. 1. Hyp. 2.*) in a *time* greater in a duplicate proportion (*per præm. 2. vel per Cas. 3. Hyp. 1.*) as if double in *length* and *cize*, to double the *distance* $PR = 2 PQ$ in quadruple the *time*; and so will strike an under *disdiapason* or 15^{th} to CD . 1 to 4 *vibr.*

Cas. 5. Let $AB > CD$, *Tab. 15. Fig. 5.* have a *cize* as much *less* as 'tis *longer*, and the same *tension*; 'twill with the same *force*, *vibrate* to a greater *distance* proportionably (*per præm. 4. vel Cas. 1. Hyp. 2.*) as if twice as long to double the *distance* $TX = 2 TV$, in the same *time* (*per præm. 2.*) and so keeping pace in their *vibrations* will strike *unisons*, 1 to 1 *vibr.*

Cas. 6. Let $AB > CD$, *Fig. 4.* have both *cize* and *tension* as much greater as 'tis *longer*, 'twill *vibrate* to the same *distance* PQ (*per præm. 4. vel Cas. 2. Hyp. 2.*) in a longer *time* proportionably (*per præm. 2.*) as if double the *cize*, in twice the *time*, and so will strike an under *octave*, 1 to 2 *vibrations*.

Cas. 7. Let $AB > CD$, *Fig. 5.* have both *cize* and *tension* as much *less*, as 'tis *longer*; 'twill *vibrate* to a *distance* greater in a duplicate proportion (*per Cas. 3. Hyp. 2.*) in a *time* proportionably greater (*per præm. 2.*) as if double the *length*, it has but half the *cize* and *tension*, to quadruple the *distance* $TY = 4 TV$ in twice the *time*, and so will strike an under *octave* 1 to 2 *vibr.*

Cas. 8. Let $AB > CD$, *Fig. 4.* have a *cize* as much greater, and a *tension* as much *less* as 'tis *longer*; 'twill *vibrate* to a *distance* greater in a duplicate proportion (*per Cas. 3. Hyp. 2.*) in a *time* greater in a triplicate proportion (*per præm. 2.*) as if double

ble in length and *cize*, and but half so much *tended*, to quadruple the *distance* $PS=4PQ$ in octuple the *time*; and so will strike an under *trifdiapason*, or a 22^d , 1 to 8. *vibr.*

Cas. 9 Let $AB > CD$, *Fig. 5.* have a *cize* as much *less*, and a *tension* as much *greater* as 'tis *longer*; 'twill *vibrate* to the same *distance* TV (per *Cas. 2. Hyp. 2.*) in a time proportionably *less* (per *præm. 2. vel Cas. 3. Hyp. 1.*) as if half the *cize* in half the *time*; and thereby will strike an upper *octave*, 2 to 1 *vibr.*

All which *Cases*, may be thus briefly expressed (putting T for *Tension*, D for the *Cize* or *Diameter*, and L for the *length* of the *string*;) supposing $\frac{T}{L \times D} = 1$ to be the *acuteness* of the sound proposed (to which you compare the rest) the *acuteness* in the other *cases* compared to it, will be in the *proportions* following respectively.

$$\text{Hypoth. 1.} \left\{ \begin{array}{l} \text{Case 1.} \\ \frac{T}{L \times D} = 1. \end{array} \right. \quad \begin{array}{l} 2. \\ \frac{2T}{L \times D} = 2. \end{array} \quad \begin{array}{l} 3. \\ \frac{T}{L \times 2D} = \frac{1}{2}. \end{array} \quad \begin{array}{l} 4. \\ \frac{2T}{L \times 2D} = 1. \end{array} \quad \begin{array}{l} 5. \\ \frac{4T}{L \times 2D} = 2. \end{array}$$

$$\text{Hypoth. 2.} \left\{ \begin{array}{l} \text{Case 1.} \\ \frac{T}{2L \times D} = \frac{1}{2}. \end{array} \right. \quad \begin{array}{l} 2. \\ \frac{2T}{2L \times D} = 1. \end{array} \quad \begin{array}{l} 3. \\ \frac{\frac{1}{2}T}{2L \times D} = \frac{1}{4}. \end{array} \quad \begin{array}{l} 4. \\ \frac{T}{2L \times 2D} = \frac{1}{4}. \end{array} \quad \begin{array}{l} 5. \\ \frac{T}{2L \times \frac{1}{2}D} = 1. \end{array}$$

$$\begin{array}{l} 6. \\ \frac{2T}{2L \times 2D} = \frac{1}{2}. \end{array} \quad \begin{array}{l} 7. \\ \frac{\frac{1}{2}T}{2L \times \frac{1}{2}D} = \frac{1}{2}. \end{array} \quad \begin{array}{l} 8. \\ \frac{\frac{1}{2}T}{2L \times 2D} = \frac{1}{8}. \end{array} \quad \begin{array}{l} 9. \\ \frac{2T}{2L \times \frac{1}{2}D} = 2. \end{array}$$

The reason of which manner of expression, depends on this; that (in *Proportions* expressed after the manner of *Fractions*) *increasing* that above the line, doth *increase* the value (and so doth the *increase* of *Tension*, *increase* the *acuteness*;) But *increasing* that under the line, doth *diminish* the value (and so doth the *increase* of the *length*, and the *increase* of the *cize*, *diminish* the *acuteness*) in the same *proportion*. Which may serve for a brief *demonstration* of the whole.

By which may be judged of, all other more mixt or compound *Cases*, which are infinite, according to the divers unequal proportions, of *length*, *bigness*, and *tension*; but being all made out of, or founded on *these*, they will all hold true in *Analogy* to them.

204. From many of which *Cases* 'tis plain and easie, that the *sympathy* and *consent* of *strings* lies not wholly in their like *tension* and

and formation of pores, as was supposed §. 24. of the first Chapter of this Book. Whence also 'tis equally easie to make these three following *Illations*.

1. That *strings* agreeing in either *length*, *bigness*, or *tension*, can be made *unisons* but four ways. 1. If they be of the same *length*, *bigness*, and *tension* (*per Cas. 1. Hyp. 1.*) 2. Of the same *length*, and one a *cize* and *tension* equally greater than the other (*per Cas. 4. Hyp. 1.*) 3. Of the same *cize*, and one a *length* and *tension* equally greater (*per Cas. 2. Hyp. 2.*) 4. Of the same *tension*, and one as much longer as 'tis less (*per Cas. 5. Hyp. 2.*) and after the same manner when they disagree in all three, as will be obvious to the *considering*: Wherefore *unisons* are always *strings* of the same, or a proportionable *length*, *bigness*, and *tension*.
2. That *unisons* may be moved by the same force, in the same time; or being moved by the same or an equal force, will *vibrate* in the same time; as is manifest in the fore-mentioned *Cases*, to which all others bear *Analogy*.
3. That *octaves* being moved by the same or an equal force, the upper will *vibrate* in half the time, that the under does, or twice to its once (*per Cas. 2 & 3. Hyp. 1. & Cas. 1, 6, 7, & 9. Hyp. 2.*) wherefore they can by no force be made to *vibrate* together; for as much as the same *string* (being of the same *length* and *tension*) always *vibrates* in the same time; a greater force only making it fly out to a greater distance, or fetch a greater compass in its *vibrations*, and thereby move (but not *vibrate*) faster, *per Conclus. post Præmissas*. And the same is verified concerning all other *Notes*.

205. Having done with his first Principle, with the *Hypotheses*, and several *Cases* attending it, the same Reverend and Learned Dr. N. M. proceeds to his second Principle, viz. That all tuned strings either are or consist of *unisons*, which will plainly appear from the division of the *Monochord*; where,

1. *Unisons* are as AB to BC, Fig. 6. 1 to 1 part, or vibration, *per Illationem* 1. & 2.
2. A *Diapason* or *Octaves*, as BC to CD, Fig. 7. 1 to 2 *Unisons*, or 2 to 1 *Vibrat. per Illat.* 3.
3. A *Diapente*, or perfect *fifths*, as CD to DE, Fig. 8. 2 to 3 *Unisons*, or 3 to 2 *vibrat.*
4. A

4. A *Diatefferon*, or *fourths*, as *DE* to *EF*, Fig. 9. 3 to 4 *Unisons*, or 4 to 3 *vibrat*.
5. A *Ditone*, or greater *thirds*, as *EF* to *FG*, Fig. 10. 4 to 5 *Unisons*, or 5 to 4 *vibrat*.
6. A *Semiditone*, or lesser *thirds*, as *FG* to *GH*, Fig. 11. 5 to 6 *Unisons*, or 6 to 5 *vibrat*.
7. A *Diapason* with a *Diapente*, or *twelfths*, as *IK* to *KL*, Fig. 12. 1 to 3 *Unisons*, or 3 to 1 *vibrat*.
8. A *Disdiapason* or *fifteenths*, as *MN* to *NO*, Fig. 13. 1 to 4 *Unisons*, or 4 to 1 *vibrat*.

And so for the rest, whereof the chief may be expressed on one line, Fig. 14.

| | | | |
|-------|---|--------------------|-------------------|
| Where | { | AB. AC. or AC. CG. | } 8. |
| | | or AD. AG. are | |
| | | AC. AD. or AE. AG. | 5. |
| | | AD. AE. | 4. |
| | | AE. AF | 3 ^{ma} . |
| | | AF. AG. | 3 ^{mi} . |
| | | AD. AF. | 6. |
| | | AC. AF. | 10. |
| | | AB. AD. or AB. BE. | } 12. |
| | | or AC. AG. | |
| | | AB. AE. or AB. BF. | } 15. |
| | | or AB. CG. | |
| | | AB. AF. or AB. BG. | 17. |
| | | AB. AG. | 19. |

206. And thus much for his *Principles*, whence he goes on to some special or *particular Propositions*, in order to demonstrate the late observed *Phænomena*, which immediatly follow.

Prop. i. If two strings be tuned *Unisons* AB. BC. Fig. 6. and either be touched with the hand or bow, the other will answer it, by trembling at its motion.

For the *Air* being put into an *arched figure* and *motion* by the string that is touched, rolls away to the other, which finding of a *length*, *bigness*, and *tension*, that are the same, or proportionable (*per Illat. 1.*) it easily (by the force it received from the touched string) imprints

imprints both *figure* and *motion* into it, in the *first Case* (*per Cas. 1. Hyp. 1. Princ. 1.*) or else communicates its *motion* only, in the *second*, (*per Illat. 2.*) whereby the next undulation of *Air*, from the touched *string*, taking it just at its return, and in like manner the consequent ones, and moving it as before, they continue their *vibrations* together, *passibus æquis, Q. E. D.*

Prop. 2. *If the lesser of two Octaves BC, be touched Fig. 7. each half of the greater C2, 2D will answer it, the middle 2 standing still; which he thus demonstrates.*

About *CD* wrap loosely 3 narrow *strips* of *paper*, one in the middle 2, the other betwixt *C2* and *2D* (*exemp. gr. in p and q*) then with the *finger* or *bow* strike *BC*, or any part of it, and you will see the papers in *p q*, dance and play up and down and about the string, 'twixt *C2* and *2D*, but that in 2 stand still. Whence it is evident, that *CD* moves in its two *halves*, by two *distinct* motions. Which he thinks occasioned by the arched *Airs*, rushing with the *force* of *BC* against all *CD*, and moveing it somewhat forward out of its place; but finding it of a disproportionate *length, bigness, and tension*, to be excited by so quick *vibrations*, as may correspond with those of *BC*, and the undulations whereinto they strike the *Air* (by which alone it causes any string to *vibrate*) *per Illat. 3.* the second *undulation* of the *Air* from *BC* meets *CD* just at its return (*CD's vibrations* to *BC's*, and the *Airs undulations* caused thereby, being as 1 to 2) whereby it is beat back, and rebounds from 2 towards *BC*, when the third *undulation* from *BC* occurring, forces it forward again; whereupon (not being able to move backward nor forward) the *undulations* break and roll away to each side, towards *C* and *D*. Which parts *C2. 2 D* being *Unisons* to *BC*, *per Princip. 2.* it easily moves them *per Prop. 1.* and so, (though *Des Cartes* denys it^o) they apparently *vibrate* in *p q* (*vid. Fig. 15.*) by two *distinct* motions, *Q. E. D.*

Prop. 3. *If the greater of two Octaves CD be toucht on either of its halves C2. 2D. all the lesser will answer it, but if on the middle 2 it will stir no where. Which is thus demonstrated.*

About *BC*, *Fig. 7.* wrap loosely one *strip* of *paper*, then with the *finger* or *bow*, strike *CD* on either *half*, *C2* or *2 D*, and you will see

^o *Des Cartes Mus. Comp. p. 5.*

the paper dance and play as before, and that in all parts of BC alike; but if you strike it on the *middle* 2, the paper will not stir. The reason whereof seems to be, that $C2$. $2D$ being *Unisons* to BC , *per Princip.* 2. if either be touched, BC will answer it, *per Prop.* 1. But CD having a disproportionate *length*, *bigness* and *tension* to BC : if touched in 2 (whereby the whole *string* is equally moved) it cannot affect it, by reason of their different *vibrations*; as in the former *Proposition*, *Q. E. D.*

Note that this, and (especially) the following *Experiments*, must be tryed curiously by a gentle touch of the *string* (only so hard as to make the *papers* move) and that with a *bow* rather than the *finger*: For if CD be touched boldly in 2 (with the *finger* he means, not the *bow*) by reason of the strong motion communicated to its *parts* (and happily divided there, which perhaps may be the cause too, why, if you strike it with the *bow* in 2, it sends forth forth a screaming broken sound) BC will tremble, but with a motion nothing so *brisk*, as when touched with but half the *force* any where else.

Prop. 4. If the lesser of two Fifths, CD Fig. 8. be touched on either of its halves $C2$. $2D$, each third part of the greater D X , XZ , ZE , will answer it, but if in the middle 2 they will not stir. Which will plainly appear,

By laying *papers* as before, on t , x , z , v , if then you strike CD on $C2$ or $2D$, you'll see the *papers* on t , z , v , frisk and daunce, while those on x and z stand still, but if you strike it on 2 none will move. *Demonstratio eadem est cum superioribus*, for $C2$. $2D$ are *Unisons*, and CD an *Octave*, to DX , XZ , ZE , *per Princ.* 2.

If it be demanded, wherefore DZ or XE (which are *Unisons* to CD *per Princip.* 2.) do not *vibrate* when it is touched in 2. He answers, if DZ , then by the same reason XE also, and so XZ would at the same time be moved by contrary motions, as in *Fig. 16. Q. E. A.*

Prop. 5. If the greater of two fifths DE be touched, Fig. 8. on either of its thirds DX , XZ , ZE , each half of the lesser $C2$. $2D$, will answer it: but if in the divisions XZ , they will not stir.

Experimentum & demonstratio instituuntur ut supra, DX , XZ , ZE , being Unisons to $C2$. $2D$, and octaves to CD , per Princip. 2.

If it be askt, why, when *DE* is toucht on *X* or *Z*, whereby the conterminous parts seem principally to be moved, *CD* does not *vibrate*, which is *Unison* to it. He answers, that if all *CD* could tremble, then beating the *Air* back again on *DE*, it would at once shake *DZ* and *XE* (*Unisons* to *CD*) as in the former *Propos. Q.E.A.*

Prop. 6. If the lesser of two twelfths *IK*, Fig. 12. be toucht, each thirdpart of the greater, *K a, a b, b L*, will move; but in the divisions, *a b* stand still. On the contrary, if the greater be toucht on its parts, *K a, a b, b L*, all the less will tremble; but if on the divisions *a b*, it will not stir.

Experimentum & Demonstratio ut ante, *IK* being a *Unison* to *K a, a b, b L*, per Princip. 2.

Prop. 7. If the lesser of two fifteenths, *MN* Fig. 13. be toucht, the greater will move in all its quarters *N c, c 4, 4 d, d O*, but not in their divisions, *c 4 d*. On the contrary, if the greater be toucht on either of its quarters *N c, c 4, 4 d, d O*, all the less will move; but if on the divisions *c 4 d*, it will stand still.

Experimentum & demonstratio instituuntur ut supra. *MN* being *Unison* to *N c, c 4, 4 d, d O*, per Princip. 2.

207. Thus having cleared the late observed *Phænomena* mentioned above in §. 199. he infers the following *Corollaries*:

1. That all *Consonancy* (or *Sympathetick* motion of strings) is made by *Unisons*, that is, 1 moves 1, and not 1.2, or 2.3, &c. as appears from the fore-going *Propositions*. Hence
2. That each string at the due touch of another, will tremble in as many places as it contains *Unisons* thereunto, whether to the whole or its parts. So a lower octave in 2, each half being *Unison* to the higher; a lower fifth in three, and the higher in two, they being as 3 *Unisons* to 2, &c. Hence
3. That all tuned strings whatever (whether thirds, fourths, fifths, sixths, &c.) will answer each other more or less, at the due touch of their *Correspondents*: But the tremor or vibration in some of them being made in many places at the same time (according to the number of the *Unisons*, per Corol. 2.) and therefore not great, where the part moved is but short (per Cas. 1. Hyp. 2. Princ. 1.) it cannot always be discerned by the

by the *sense*, but follows by a parity of *reason*; contrary to what *Des-Cartes*^P asserts, that such vibrations are found only in upper *thirds* and *fifths*.

208. From the same *Principles* may be shewn how a *Man* may strike any two *Notes* with his *mouth* at the same time. For if a *Man* open his *mouth* in two places at once, as *AB* to *BC*, *Fig. 17.* or as 1 to 2 both in *length* and *breadth*, and then force out the *breath* strongly against them (thus opened) so that the sound be all begotten there (as in *whistling*) you will hear distinct and perfect *octaves*, per *Princ. 2.* And so secondly, if a *Man* can open his *lips* as *BC* to *CD*, *Fig. 18.* or as 2 to 3 in *length* & *breadth*, and do as before, he will strike *fifths*, per *Princip. 2.* And after the same manner for the rest of the *Notes*, according to the division of the *Monochord*.

209. According to which *Hypothesis* one *Hooper* here of *Oxford* could so close his *lips*, as to sing an *octave* at the same time. And I know two other persons now living here, that can do it though their *lips* seem not to be set in that posture, yet they shut them so close that they can by no means pronounce any thing *articulate*. But he that excels them all, and indeed to a miracle, is one Mr. *Josuah Dring*, a young Gentleman of *Hart-hall*, who sings a Song *articulately*, or *patulo*, and all in *octaves* so very strongly, & yet without much straining, that he equals if not excels the loudest *Organ*.

210. By what means he performs this, is hard to guess, unless the *Epiglottis* and *Uvula* be both concerned in it, one sounding the upper, and the other the lower *octave*: or either of them apart, opening unequally as 1 to 2 in *Fig. 17.* or which is most likely of the three, by an unequal application of the *Uvula* to the *Epiglottis*. For his own part he can give but little account of it himself, only that he performs it in the lower part of his *throat*, and that it came casually on him at first, upon straining his voice; yet must it not be reckoned a meer *casualty* neither, for he sings these *octaves*, or otherwise (and both very strongly) according to pleasure. And this is all I know of new, concerning the *Mathematicks*, except there be any thing of *Choregraphy* in the Map of *Oxford-shire* prefixt to this *Essay*, that may be thought worthy the name of a new *Contrivance*.

211. In *Natural Philosophy*, *Medicine* and *Anatomy*, there have also been many new *Inventions* and *Improvements*, made of later years in this *University*, which as they promiscuously fell out in order

of *time*, immediatly follow. The Honorable and Ingenious Robert Dudley Esq; formerly of *Christ Church* aforementioned, titular Duke of *Northumberland*, was the first *Inventor* of the *Pulvis Cornachinus*, being a mixture of *Diagridium*, *Tartar*, and *Diaphoretic Antimony*, with *cream* of *Tartar*, the proportions varying *pro re natâ*^a; a *Medicine* of such general and excellent use, that *Marcus Cornachinus* (from whom it has its name) wrot a whole Treatise concerning it, commending it to the World as highly useful in all Diseases whatever, requiring *Purgation*.

212. Nor doubt I in the least, notwithstanding the pretensions of the famous *Thomas Bartholin*, and *Olaus Rudbeck*, but that the ingenious Mr. *Jolliff* of this *University*, first of *Wadham*, and after of *Pembroke College*, was the first *Inventor* of that fourth sort of *Vessels*, plainly differing from the *Veins*, *Arteries*, and *Nerves*, now commonly called the *Lympheducts*: That he knew them about the beginning of *June*, *An.* 1652. we have the testimony of the learned and famous Dr. *Gliffon*, to whom he discovered them, coming to *Cambridge* to take his *Doctors* degree^r; at what time, says the Learned Dr. *Walter Charleton*, 'tis plain from *Bartholins* own Book set forth in *May*, 1653. that he scarce ever dreamt of them^s.

213. Yet I know the Learned *Bartholin*, amongst his *Anatomical Histories*, tells us he first found them the 15th of *Decemb.* 1651. and again, the 9th of *January*, and 28 of *Febr.* 1652^t. and that the Learned *Olaus Rudbeck* says, He first discovered them in *October* and *November*, 1650^u. both anticipating the date of Dr. *Gliffon*. But I have been frequently told by my worthy and learned Friend, Dr. *Robert Stapely*, an eminent *Physitian*, and one of unquestionable fidelity, Contemporary with Mr. *Jolliff* at *Pembroke College* till *Oxford* was made a Garrison for the *King*, about the Year 1642. that they were often shewn to him by the same Mr. *Jolliff* while they were Students there. To which add the Testimony of the fore-cited Dr. *Charleton*, that these *Vessels* were known & commonly talked of amongst the *Fellows* and *Candidats* of the Famous *College* of *Physitians* in *London*, many years before they heard any news of them from beyond *Sea*^w. Not to mention that Dr. *Highmore* seems to have noted something of them, though veiled under a different name and description.

^a Vid. Jo Schroderi *Pharmacop. Medico-Chym. lib. 2. cap. 77.* ^r Fran. Gliffonii *Anatom. Hepatis, cap. 31.* ^s Gualt. Charletoni *OEconom. Animal. Exercit. 9.* ^t Tho. Bartholini *Historiar. Anatom. Rar. Cent. 2. Hist. 48.* ^u Rudbeckii *Epist. ad Bartholin. de Vasis Serosis, p. 11.* ^w Idem loco citato. Vid. etiam *Epist. Timoth. Clark, M.D. Philoloph. Transact. Numb. 35.*

214. The same Learned Dr. *Higmore*, formerly of *Trinity College Oxon.* was the first that we know of that treated of the structure of *Mans* body, adapting it to the then new received Doctrine of the *circulation* of the *Blood*; for the proof whereof he seems chiefly to have intended his piece of *Anatomy*, dedicating it to the *Author* of the *Invention*, the famous Dr. *Harvey*: Wherein he has several new *Cuts* of the *Spleen*, *Pancreas*, *Testes*, &c. of which, though most have since received considerable *Improvements* from *others*, yet it must be acknowledged that he deserved very well for his diligent and laborious search into them all, but more particularly for his first *discovery* of the new *ductus* for the carriage of the *seed* from the *Testes* to the *Paraſtatae*^x, and for his new descriptions of the *Vessels* and *Fibres* of the *Spleen*, by the ancient *Anatomists* held to be *Veins*^y, and of the intricate *plexus* of the *Paraſtatae*, &c.^z.

215. In *Natural Philosophy*, the famous Dr. *Willis* of *Christ Church College Oxon.* and *Sidleyan* Professor of *Natural Philosophy* in this *University*, first taught us, that the *Generations*, *Perfections*, and *Corruptions* of *Natural Bodies*, whether *Mineral*, *Vegetable*, or *Animal*; and so likewise of *Bodies Artificial*, do depend upon *fermentations*, raised from the different proportions and motions of *Spirit*, *Sulphur*, *Salt*, *Water*, and *Earth*, which he has constituted the ultimate sensible *principles* of *mixed bodies*^a. According to which, in his Book *de Febris*, he has given us the *Anatomy* of *Blood*, and declared the true causes and nature of *fermentations* in the *Juices*, and upon them built his most rational Doctrine of *Fevers*, *intermittent*, *putrid* and *malignant*, with particular instances and observations concerning them, much different from the ways of the *Ancients*: to which he has superadded the *Spagyrical Anatomy* of *Urin*.

216. In *Anatomy* (wherein he had the assistance of the deservedly famous, Sir *Christopher Wren*, Dr. *Millington*, Dr. *Edmund King*, Dr. *Masters*, but chiefly of Dr. *Lower*) his *method* of dissecting the *Brain* is new, and most *natural*; and so exact, that there is scarce any one part in it, but what has received considerable *advancements* from him. To mention all would be endless, let it therefore suffice, that after his description of the *Palace* in

^x *Corp. Human. disquisit. Anatom. Lib. 1. part. 4. cap. 2.* ^y *Ibid. part. 3. cap. 3.* ^z *Ibid. part. 4. cap. 2.*
^a *In Libro de Ferment.*

general, he has allotted the several apartments to the *faculties* of the *sensitive Soul*: His placing the *Spirits* to serve to voluntary actions in the *Cerebrum*, and those that serve *Involuntary* in the *Cerebellum*, is a noble and useful *discovery*.

217. His assigning the *cortical* part for generating *Spirits*, and the seat of *Memory*; the *Medullary*, or *Corpus callosum*, for the operations of the *Phantasie*; the *Corpus striatum* for the *common sense*; the *Medulla oblongata*, a *promptuary* for the *Spirits*, for performing the office of *Sensation*, and *spontaneous motion*; and the *Prominentiæ orbiculares*, and their *Epiphyses*, for conveying the *impresses* of the *passions*, and *natural instinct*, between the *Cerebrum* and the *Cerebellum*, are highly ingenious and his own; and so is his, and Dr. *Lowers* joint discovery of the curious *plexus*, of the *Vertebral* and *spinal Veins and Arteries*; their *Neurologia* is also most elaborate and no less admirable, tracing the *Nerves* from their very source, and following them through all the *Meanders* of the Body, and thence shewing us the reason of the secret *sympathies* of the parts.

218. And although Dr. *Willis* was not the first that mention'd two *Souls* in a Man, *viz.* the *Sensitive* and *Rational*; yet there is no body has proved it so well as himself; as likewise that the *sensitive* is *igneous*; and that there are two parts of it, the *flammea* and *lucida*: Where he discourses of the manner how the *Soul* performs its *operations* in us; he does it, as indeed he has done all, with the greatest *Improvements* within the compass of *Wit* and *Reason*: And having fully discovered the *Hypothesis* of the *sensitive Soul*, its *affections* and *senses*; he further obliges *Mankind* with a most rational account of the *diseases* seated in it, and the *Nervous Juice*, according to the different parts of the *Brain*, and the *Systema nervosum*; placing *Cephalalgies* in the *Meninges*; *Lethargies*, *somnolentia continua*, *Coma*, *Carus*, *Pervigilium*, and *Coma vigil*, in the *Anfractus* and *Cortical* part of the *Brain*; the *Incubus* in the *Cerebellum*: Then descending to the *Corpus callosum*, he finds the *Spirits* there sometimes hurled round into *Vertigo's*, sometimes exploded in *Spasms*, *Convulsions*, *Epilepsies*, sometimes eclipsed in *Apoplexies*.

219. In the *Corpora striata*, and *Medulla oblongata*, if the *spirits* that serve to *motion* be disturbed, thence he shews come likewise *Spasms* and *Convulsions*; if those that serve to *sensation*, *dolor*; if either, or both, are impeded or destroyed, the *Palsie*:

And

And as the *sensitive Soul* is the seat and organ of the *Rational*, so the ill constitution of *that* (he observes) proves oftentimes the disorder of the *other*: For the *Animal spirits* being *spirituo-saline*, if they are *inflamed*, they produce a *Phrensie*; if *acid*, *Melancholy*; if *acrous*, like *Aqua stygia*, *Madness*; if *vapid*, *Stupidity*. In discoursing of which distempers, his *Ætiologies* of the various *symptoms*, his *methods* of cure, and forms of *prescriptions*, are founded upon far more rational *principles*, than ever *Greece* taught us. And how far *Antiquity*, and later *Ages* too, were mistaken in their notions of divers other *diseases*; his evincing *Hysterical* and *Hypochondriacal* affections, the *Colic*, *Gout*, *Scurvy*, some sort of *Asthma's*, the *Tympanitis*, with *others*; either wholly, or in part to be *Nervous*, does plainly demonstrate.

220. Nor has the *Pathological* part of *Physick* been only happy in his *labors*; but the *Pharmaceutical* part likewise highly improved in the *Inventions* of his *Spiritus Salis Armoniaci succinatus*, *Syrup* of *Sulphur*, *preparation* of *Steel* without *Acids*, and from thence of his *artificial Acidulae*: In general, this part of *Physick* has been so far advanced by him, that what was formerly *Empirical*, and but lucky hits, is now become most rational, by his making the *operations* of *Chathartic*, *Emetic*, *Diaphoretic*, *Cardiac*, and *Opiat Medicines*, intelligible by *Mechanical Explications*; having subjoined to each most neat and artificial *Formula's*, as well *Chymical* as *others*; a *Province* but meanly adorned by the *Ancients*, though of infinite use. And where *Nature* is exorbitant in any of these *Evacuations*, he has likewise taught us how to check and reduce her; adding for the better illustration of the whole, a new *Anatomy* of the *Stomach*, *Intestines*, *Gula*, *Veins*, and *Arteries*.

221. Which he has seconded with a further discovery and rational account of *Thoracic* and *Epatic Medicines*, and of the *Diseases* belonging to those *parts*; discoursing also of *Venesection*, stopping of *Hemorrhagies*, of *Issues* and *cutaneous Distempers*: In all which it may be observed, what is almost peculiar to him; that there is nothing *trivial*, most *new*, and all most *ingenious*. To which add, that the *organs* of *Respiration*, which have been the *subject* of so many Learned Pens of late, are best understood, from his most elegant *descriptions*, and beautiful *Cuts*. But it is too difficult a task to give a just account how far *Physick*, *Anatomy*, *Chymistry*, and *Philosophy*, stand indebted to him for their *Improvements*.

licular Repositories or *Bags*, near the exit of the *Intestinum rectum*, wherein they keep those *humors* or *liquors*, that are the *Vehicles* of their respective *scents*.

229. This he first observed in a male *Pol-cat* he dissected here at *Oxford*, *Febr.* 4. 1674. and was further confirmed therein the second of *March* in the year following, 1675. in a female *Pol-cat*, at the opening whereof I was present my self; since which times, he has found the same in a *Fox* dissected in the presence of *Dr. Grew*; and since again in *Weasels*, *Cats*, &c. the *vesicles* or little *bags* being found by *pairs*, one on each side the *gut*; and according to the bigness of the *Animals*, largest in the *Fox*, and least in the *Weasel*.

230. Those of the *Pol-cat* were about the bigness of *Peas*, of a somewhat oblong *figure*, and a yellowish colour, and seemed to consist of a double substance, *glandulous* and *membranous*; the *membranous* toward the necks of the *bags* being cover'd with *glandules*, but toward the *fundus* wholly *membranous*, representing upon being emptied, *orbicular muscular Fibres*, which he supposes by *contraction* force the contained *humor* out into the *gut*.

231. The use of the *Glandules* he doubts not to be, to sepearate the *humor* from the mass of *blood* (all *secretions* in the *Body* being performed by the help of *Glandules*) and the necks of the *bags* immediately emptying themselves into the *gut*, without any continued *ductus*; and being placed near the *Sphincter Ani*, made him think the contained *humor* in respect of the *Animal*, to be *excrementitious*. In this *Pol-cat* it was of somewhat a thick *consistence*, for the most part *white*, but in some places of a *greenish yellow* colour, and upon pressing out, of so strong a *scent*, that I could scarce (I well remember) endure the *room*; which once removed from the *body*, we could not perceive any considerable ill *smell* in any of the other *parts*.

232. In a *Cat* that he dissected (which was but a young one, and a *female*) the *bags* when blown up were not above the cize of ordinary *Peas*, seated like the former on both sides the *intestinum rectum*, just under the *Sphincter Ani*, which covering them, he supposes might both occasion their not being noted before, and help in the expression of the *humor* out, which (he observed in the *Cat*) was not into the *gut*, but in the *limb* or *margo Ani*, the orifices of the *bags* terminating there, so that he plainly perceived them before

before he began to dissect her : The *Glandules* that separate the *humor* from the mass of *Blood*, and transmitted it into the *bags*, afforded a pleasant sight, there being seven small round *ones* placed in a *circle* about the *vesicles*, the *humor* within not being considerable but for the *fator*.

233. Such *Glandules* (which he thinks hold the nature of *Emundories*) he has likewise observed in *Rabbits*, but with no considerable *cavity*, the *liquor* whereof he rationally guesses may give the *rank taste* we find about those *parts* after they are roasted : He thinks also such like *Glandules* are found in *Mice* and *Rats*, and observes that in some *Animals* they are found more *glandulous*, in others with a more signal *bag* or *cavity*. And *analogous* to these *scent-bags* in *Quadrupeds*, he believes those *Glandules* seated on the *rumps* of *Fowls*, whose *excretory vessels* may be those little *protuberances* or *pipes* we observe on them ; whence 'tis also (as in *Rabbits*) that we find the *rumps* of *Fowls* strongest tasted, and to partake most of the *natural scent* of the *Fowl*.

234. That all *Animals* conserve their peculiar *scents* in such like *parts*, though he dares not assert ; yet if the *analogy* that *Nature* observes in forming most of the *parts*, of most *Animals* alike, be sufficient *Logick* to warrant an inference, he thinks it highly probable that 'tis so in *most* ; and that should they be found in *Man* (which he has not yet had opportunity to Experiment) it might be worthy enquiry how far *Fistula's*, *Tenesme's*, &c. might be concern'd in *them*. Which is all I have met with new relating to this *County*, in *Medicine*, *Anatomy*, or *Natural Philosophy*. For to mention the many and new *Experiments* of the Famous Mr. *Boyle* (did we distinctly know which were made *here*) would be endless, and to recapitulate the *New Discoveries* (if there be any in this *Essay*) but a vain repetition.

C H A P. X.

Of Antiquities.

AN D thus having finish'd the *Natural History* of *Oxfordshire*, I had accordingly here put a period to my *Essay*, but meeting in my *Travels* with many considerable *Antiquities*, also relating to *Arts*, either wholly past by both by *Leland* and *Camden*, or but imperfectly mention'd; and finding that I may as well also note them in other *Counties* hereafter, as let them alone: I have been perswaded to add (because perhaps a *digression* that may be acceptable to some) what I have met with in this *kind*, whether found under ground, or whereof there yet remain any foot-steps above it; such as ancient *Mony*, *Ways*, *Barrows*, *Pavements*, *Urns*, ancient *Monuments* of stone, *Fortifications*, &c. whether of the ancient *Britans*, *Romans*, *Saxons*, *Danes*, *Normans*. Of which in their order,

2. Leaving the *Antiquities* and Foundations of *Churches* and *Religious Houses*, their *Dedications*, *Patronages*, and foundation *Charters*; with the *pedigrees* and *descents* of *Families* and *Lands*, &c. as sufficient matter for another *Historian*, and as too great a *task*, and too much beside my design, for me to attempt. However, I have taken care in the *Map* prefix'd to this *Essay*, to put a *mark* for the site of all *Religious houses*, as well as ancient *ways* and *Fortifications*, except *Brockeley* and *Saucomb*, both mention'd in the *Catalogues* of *Harpsfield*^b and *Speed*^h, which I could not find out, though I sought them diligently.

3. Of *British Antiquities* that are certainly such, I have met with none here but some *pieces* of their *Mony*; whereof, as much as I find not *described* before, I have caused to be delineated, *Tab. 15. Fig. 19, 20, 21*. Of which the first no doubt is a *Coin* of King *Cunobelin*, a *King* here in *Britan* at the time of the *birth* of our *Saviour* *CHRIST*; it shewing a *Horse*, and his *Inscription* on one side, and an *Ear* of *Corn* and *CAMU* on the *reverse*; intimating the place of its *coinage* to be *Camulodunum*, the *Royal City* and *seat* of *Cunobelin*.

^a *Catalogus Aedium Religiosar. in fine Hist. Angl. Ecclesiast.* ^b *History of Great Britan. lib. 9. cap. 21. sub finem.*

4. *Camden*, 'tis true, has described a *Coin* of the same *King*, not differing in the *reverse* at all from this; but the *Inscription* of ours varies from his, in that the final *Letter O*, is not plac'd in a line with the rest of the preceding *Letters* under the *Horses* feet, but just before his *breast*; the *Horse* having also a *spica* or ear of *Corn* (or some such like thing) placed over his back, *Fig. 19.* which is not to be found in any of *his*. This was dug up at *Wood-Eaton* this present Year 1676. near the House of the Worshipful *John Nourse Esq;* amongst old *Foundations*, and kindly bestowed on me by the same worthy *Person*.

5. At the same time and place, the small one next engraven, *Fig. 20.* was also dug up, but whether of the same *King* or no, does no where appear, it having nothing upon it but somewhat like a *Chalice*, and a crooked *lineation*, under which there is also a forked kind of *Figure*, and a small *Crescent*; unless the *affirmative* may be collected from the last of these, the *Crescent* being to be met with on *Cunobelins* mony, as is plain from *Mr. Camden*, and so on the *mony* which he thinks carries the name of the *City Callena*, alias *Gallena*, now *Wallingford*ⁱ: Whereof though I can give no better account, I however thought fit to give a draught of it, because possibly it may meet with a *Reader* that can.

6. But for the *third*, that seems adorned with two *faces* on the *obverse*, and an ill shapen *Horse* and a *wheel* underneath him on the *reverse*, *Fig. 21.* dug up at *Little Milton*, now in the possession of my Reverend and Learned *Friend*, *Mr. Obadiab Walker* the worthy *Master* of *University College*; I take, notwithstanding the want of an *Inscription*, to be a *coin* of *Prasutagus*, *King* of the *Iceni*, mention'd by *Tacitus*, who out of hopes of preserving his *Kingdom* and *House* quiet after his *death*, made the *Emperor Nero*, and his two *daughters*, Co-heirs of his *Fortunes*. And that the two *faces* are of him and his valiant *Queen Boodicia*^k, otherwise called by the same *Tacitus*, *Boudicea*^l, and *Voadica*^m, who in revenge of her own *daughters* ill usage by the *Romans*, after the decease of her *husband*, raised an *Army* against them, utterly vanquish'd the ninth *Legion*, sack'd *Camulodunum* and *Verulam*, and slew no less then seventy thousand of themⁿ.

7. And the ground of this conjecture, I take from the *reverse*

ⁱ See *Camdens* general History of *Britan.* ^k *Taciti Annalium*, lib. 14. cap. 31. ^l *Ibidem* cap. 35. ^m *Id.* *Libr. Tacit. de Julii Agricola vita*, cap. 16. ⁿ *Taciti Annalium*, lib. 14. cap. 33.

with the *Horse* and *wheel* under him, most times found on the *Coins* of the same *Boodicia*, where her name is stamp'd on them, as may be seen both in Mr. *Camden* and Mr. *Speed's* Histories : by the *horse* and *wheel* intimating perhaps their great strength to lie in their *Effeda*, a sort of *Chariot* much used by the *Britans* in War, as is testified by *Cæsar* °, and particularly by *Tacitus* of this very *Boudicea*, viz. that she was drawn in a *Chariot*, with her daughters placed before her^p, when she came to fight *Suetonius* then *Proprætor* of *Britan*. Or else perhaps by this time having learned of the *Romans* the necessity and convenience of making *military ways*, and other passages for Carriages through the *Woods* and *marish* grounds ; in memory of the fact, after the manner of the *Romans*, as may be seen on the mony of *Trajan*, *Hadrian*^r, &c. they might put these *horses* and *wheels* on their *Coin*.

8. Which is all I know remarkable in these *British* pieces, but that they are all hollowed to a *concave* on one side, and *convex* on the other (a concomitant of most, if not all *British* coin) and that they are all *gold*, or at least *Electrum*, as most of the *British* mony we now find is, which is a sort of *metal* compounded of *gold* and *silver*, and this done either by *nature*, or proportioned by the *Artist*. That there is such a *metal* as *natural Electrum*, we have not only the testimony of *Pliny*^s, who says, 'tis found commonly in trenches and pits. But of *Servius*^t, and St. *Isidore* Bishop of *Sevil*, the latter whereof asserts, that the *natural Electrum* is of great value, *Quod naturaliter invenitur in pretio habetur*, are his very words, for that it is more pure than any other *metal*, and that if poison be put into a vessel made of it, it makes a hissing sparkling noise (as *Pliny* also witnesses) and casts it self into *semicircles*, resembling *Rain-bows*, as well in colours as figure^u.

9. To which add the testimony of *Peter Martyr*, a person of unquestionable credit and veracity, who himself saw a great piece of pure *natural Electrum*, so heavy, that he was unable to move it one way or other, much less to lift it with both hands from the ground : they affirmed (saies he) that it weighed above 300 pounds, at eight ounces to the pound, and that it was found in

° *Jul Cæsar's Comment. de Bello Gallico, lib. 4.* ^p *Tacit. Annal. lib. 14. c. 35.* ^r *Vid. Ducis Croyiaci & Archotani Numismata, Tab. 36.* ^s *Lervini Hulsii Imp. Rom. Numismatum seriem. in Hadriano.* ^t *Nat. Hist. Lib. 33. c. 4.* ^u *Maur. Servii Honorat. Comment. in Pub. Virgilii, Æneid. lib. 8. ad v. 204.* ^v *Isidori Epi. Hispalensis, Originum lib. 16. cap. 23.*

the House of a certain Prince, and left him by his *Ancestors*. And albeit, that in the days of the *Inhabitants* then living, it was no where digged, yet knew they where the *Mine* of it was, but were very unwilling to discover the place; yet at length they did, it being ruinated and stopt with stones and rubbish; being much easier to dig then *Iron mine*, and might be restored again, if *Miners*, and others skilful therein, were appointed to work it^w.

10. Some such *natural Electrum* seems also to be hinted in the *Civil Law*, and to have been mixed with *Silver*. *Neratius* reporting that *Proculus* gave sentence, that it was no matter in a Legacy of *Electrine vessels*, how much *Silver* or *Electrum* was in them, but whether the *Silver* or *Electrum* exceeded? which might easily be perceived by ocular inspection; or if so equally mixt that it could not be done, that then recourse was to be had to the *Estimat* of the *Testator*, amongst which sort of *vessels* he usually accounted them^x. Whence 'tis easie to collect, that the *Electrum* here spoke of, can be no artificial mixture of *silver* and *gold*, again mixed with *silver*; but a *natural metal* before it mixture with *silver*.

11. Moreover, that there is also an *artificial Electrum*, is as evident from the *Institutes* of the Emperor *Justinian*^y, and *Q. Flor. Tertullian*^z: made by intermingling *gold* and *silver*, according to the natural mixture; which according to *Servius* and *St. Isidore*^a, was of *gold* in a *triple*, but according to *Pliny*^b and *Monsieur Savot*^c, in a *quadruple* proportion, to one of *silver*; viz. 19 *Carats* $\frac{1}{2}$ of *gold*, and 4 *Carats* and $\frac{1}{2}$ of *silver*; which as the same *Savot* testifies, were the proportions observed by the Emperor *Severus Alexander*, and *Lewis* the Twelfth of *France*, by an *Ordinance* made at *Blois*, of Nov. 19. 1506. for the *French gold*.

12. Which very proportions I should be willing to think our *British coins* to have; only I guess the *Britans* had, and made use of, as little *Art* as might be: Wherefore I am enclined to believe them rather *native Electrum*, dug and coined thus according as they found it, either richer or poorer; for I have seen some pieces of this sort of *mony*, much richer in *gold* then some others are. That *gold* and *silver Mines* were worked here in *Britan* in those

^w *Petri Martyris Anglerii de Orbe Novo, Decad. 1. cap. 4.* ^x *ff. De Auro Argent. &c. Leg. Pediculi, §. Neratius.* ^y *Institut. de Rerum divisione, §. Si duorum.* ^z *Q. Septimii Florent. Tertulliani Lib. advers. Her- mog. cap. 25. & adversus Praxean. cap. 27.* ^a *Locis supra citatis.* ^b *Loco citato.* ^c *Louis Savot de la Matiere des Medalles antiques, 2 part. chapitre 9.*

ancient days, is plain out of *Tacitus*: *Fert Britannia* (says he) *Aurum & Argentum, & alia metalla, pretium victoriæ*^d. And Prince *Galgacus* chief Captain of the *Britans*, now beat Back as far as *Mount Grampius* in *Scotland*, in his speech (before the fight with the *Proprætor Agricola*) exciting them to indignation against the *Romans*; amongst other things tells them, that these were the men that had taken from them their fertile *Soil*, their *Mines*, and trading *Towns*: *Neque enim Arva nobis, aut metalla, aut Portus sunt, quibus exercendis reservemur*^e. Now all *gold* whatever containing some *silver* more or less, and the *Britans* not being able to refine it then, as in after Ages, were necessitated to coin *Electrum* after this manner.

13. That they had and coined *silver* in these early times, is also plain from Mr. *Camden*, Mr. *Speed*, &c. who have given us draughts of *silver* Coins of *Cunobelin*, *Venutius* King of the *Bri-gantes*, and *Caractacus* King of the *Silures*, both which make not a little for the reputation of my conjecture § § 62 and 63 of the sixth *Chapter* of this *Essay*, the *Mines* there mention'd, in all probability, being some of those spoken of by *Tacitus*, and perhaps first belonging to the *aboriginal Britans*, and after to the *Romans*.

14. To this if it be objected out of *Cæsar's Commentaries*, that the *Britans* then used only *Copper* (and that imported) and *Iron rings* instead of *mony*^f; and that this *gold* might either be also imported, or the *Mines* discover'd after the conquests of the *Romans*. It may rationally be answer'd, that *Cæsar's* account of the State of *Britan* (as has been shewn also before in another case; *Chap. 3. §. 2.* of this *Essay*) is as imperfect as his *Victories* or *Travels* in it were. For we find in Mr. *Speed* a *gold* coin of King *Cassivellaun*, who was King here in *Britan* at *Cæsar's* arrival; beside the *Romans* came then not to enrich, but to spoil *Britan*, how unlikely it is therefore they should supply them with *gold*, or find them *Mines* so early, let the *Reader* judge.

15. Whereunto it may be added (as *Tacitus* informs us) that *Cæsar* rather discovered then conquered *Britan*; that he rather frightened the *Inhabitants* on the shoars, than got footing there: *Quanquam prosperâ pugna terruerit Incolas, ac littore potitus sit, potest*

^d *Tacitus in vita Julii Agricolaë, cap. 12.* ^e *Ibidem cap. 31.* ^f *Julii Cæsaris. Comment. de Bello Gallico, lib. 5.*

videri ostendisse posteris, non tradidisse ^g, are his very words of him : And that whatever he pretended at *Rome*, he got little here but dry blows, and the honor of having led an *Army* hither, Μηδὲν μήτε ἐκ τῆς Βρεττανίας, μήτε ἑαυτῷ, μήτε τῇ πόλει προσέμικτον, πλὴν τῷ ἑσρατοκένῳ ἐπ' αὐτῷ δόξα, says *Dion Cassius* of his first *Expedition* ^h. And *Tacitus* rather more than less of his *second*, who brings in *Caractacus* encouraging his *British Army* to recover their Liberty ; and in order thereunto, calling upon the names of their *Ancestors*, *Qui Dictatorem Cæsarem pepulissent*, that had driven the Dictator *Cæsar* out of the *Land* ⁱ.

16. Add further hereunto what *Strabo* delivers concerning his *Expeditions* into *Britan*, Οὐδὲν μέγα Ἀγαθαξάμικτον, οὐδὲν προσελθὼν ἐπὶ πολὺ τῆς νήσου, that he did nothing great, nor went far up into the *Island* ^k. And that *Tacitus* further confesses him beaten hence : for speaking concerning the arguments the *Britans* used amongst themselves to perswade the *Revolt* under *Voadica*, he says they brought this as a main one, that could they shew but the courage of their *Ancestors*, *Recessuros* (i. e. *Romanos*) ut *Divus Julius recessisset* ^l : intimating, that his sudden departure hence was little better than a flight. Not to mention what *Quintilian* says of one *M. Aper*, that he met with an ancient *Britan*, that avowed to him, that he was in the *British Camp* when they beat *Cæsar* from the shore ^m ; and that *Lucan* says of him expressly,

Territa quæsitis ostendit terga Britannis ⁿ.

17. After whose departure, the *Britans*, says *Tacitus*, enjoyed a long Peace, lying forgotten by the *Romans* all the days of *Augustus*, *Tiberius*, and *Caligula* ^o ; so unlikely were the *Romans* to help *Cassivellaun* or *Cunobelin* to this *Gold* or *Electrum* : Nor indeed is it probable they would do it after, in the time of *Claudius*, when they had footing here ; not only for that *mony* and *riches* are the incentives to *rebellion* ; and the very finews of *war*, but because had they thought it fit either then or before, we should certainly have heard on't in some of their writings.

18. Of *Roman Antiquities* yet remaining in this *County*, (to wave the stories of *Molmutius* and *Beline*) the most considerable of any, are their *publick ways*, whereof though there are several,

^g *Tacitus in vita Julii Agricolaë, cap. 12.* ^h *Dionis Cassii, Rom. Hist. lib. 39.* ⁱ *Taciti Annalium, lib. 12. cap. 34.* ^k *Strabon. Geograph. lib. 4.* ^l *Tacitus in vita Agricolaë, cap. 15.* ^m *Fab. Quintilianii de Oratoribus Dialog. cap. 17.* ⁿ *An. Lucani de Bello Civili, lib. 2. v. 572.* ^o *Tacitus in vita Agricolaë, cap. 13.*

and of different forms and materials, and those too broken down, and discontinued by ploughing and other accidents ; yet by their pointing, and after a diligent scrutiny, I hope I shall render at least a probable account of them.

19. But before I descend to particulars, it will be necessary I think to acquaint the Reader, that of these amongst the Romans some were called *publick*, καὶ ἑξῆς, and others *Vicinal*^p. And that the first sort of these were otherwise called (as reckon'd up by *Taboetius*^q) by these other different names, *Regiæ* (by the Greeks βασιλικαί) *Prætoria*, *Consulares*, *Militares*, *Privilegiatæ*, *Illustres*, *frequentatæ*, *Celebres*, *Eximiae*, &c. and after by the Conqueror William, in the Laws he confirmed of St. Edwards, *Chemini majores*, from the French *Chemin*, as may be seen by the Laws of the same King Edward^r : of which sort we had in all but four in England ; *Watling-street*, the *Foss*, *Ikenild-street*, and *Erming-street* ; whereof two stretched themselves from Sea to Sea the length of the Land, and the two other the breadth ; all misdemeanors committed in these, falling under the cognizance of the King himself. *Pax autem quatuor Cheminorum (intellige majorum) sub majori judicio continetur*^s ?

20. Beside these, there were many others of like erection, though of less extent, by the ancient Romans called *Vicinales*, *quod in vicos ducebant*, i. e. from Colony to Colony, from station to station ; which were also *publick*, if compared with the more private *Agrarian ways*^t. And these were after by King William called *Chemini minores*, and were the ways (as expressly described in the Laws of St. Edward the Confessor) *de Civitate ad Civitatem, de Burgis ad Burgos, ducentes, per quos Mercata vehuntur, & cetera negotia fiunt*, &c. all misdemeanors committed in these, falling under the cognizance of the Earl, or chief military Governor of the County, or of his Vice-Comes or Sheriff.

21. It will also be expedient to inform the Reader, that both the *Majores* and *Minores* were sometimes raised, and sometimes level with the ground^u, and sometimes trenched ; and the raised ones sometimes only of earth, and sometimes paved^w ; especially in moist and boggy grounds ; though it must also be acknowledged that

^p ff. *Ne quid in loco publ. vel itinere fiat*. L. *Prætor ait*, §. *viarum*. ^q *Julius Taboet. in Ephemerid. Histor.*
^r *Ἀρχαιονομία* Gul. Lambard. inter L. L. *boni Regis Edoard.* L. L. 12, 13. ^t *Ibidem*. ^s ff. *Ne quid in loco, &c.*
 L. & §. *quibus supra*. ^u *Nich. Bergier Histoire des grands Chemins de L'Empire, Liv. 2. chapitre 17.* ^w *Ibid.*
Chapitre 7.

we sometimes find them *paved*, where there was little need : which I guess might be done to exercise the *Soldiers* and *common people* of the *Country*, least by lying idle they should have grown mutinous, and affected alterations in the State. But where they were indeed laid through *meers* and low places, and necessity compelled them to raise and *pave* them, we have the exact method of making them, laid us down by *Statius* *.

*Hic primus labor inchoare Sulcos,
Et rescindere limites, & alto
Egestu penitus cavare terras :
Mox haustas aliter replere fossas
Et summo gremium parare dorso,
Ne nutent Sola, ne maligna sedes
Et pressis dubium Cubile saxis.*

i. e. that they first laid out the *bounds*, then dug *trenches*, removing the *false* earth : then filled them with *sound* earth, and paved them with *stone*, that they might not sink or otherwise fail.

22. Of the four *Basilical*, *Consular*, or *Prætorian ways*, or *Chemi-ni majores*, I have met with but one that passeth through this *County*, the discovery whereof yet I hope may prove acceptable, because not described before, or its footsteps any where noted by Sir H. Spelman, Mr. Camden, or any other *Author* that I have read or could hear of : whereat indeed I cannot but very much wonder, since it is called by its old name at very many places [*Ikenildway*] to this very day. Some indeed call it *Icknil*, some *Acknil*, others *Hackney*, and some again *Hackington*, but all intend the very same way, that stretches it self in this *County* from North-east to South-west ; coming into it (out of *Bucks*) at the Parish of *Chinner*, and going out again over the *Thames* (into *Berks*) at the Parish of *Goreing*, lying within the *County* in manner and form, and bearing to the *Parishes* and *Villages* placed on each hand, as described in the *Map* prefixed to this *Essay*, by two shaded parallel lines made up of *points*, which I have chose, to shew that this way is not cast up in a ridged bank, or laid out by a deep trench, as some others are ; described also in the *Map* by two continued parallel lines, that the *Reader*, or such as please to view them hereafter, may know where to expect a *bank* or *trench*, and where no such matter.

* *Papin. Surv. Statii Silvar. Lib. 4. in via Domitian.*

23. The reason, I suppose, why this way was not raised, is, because it lies along under the *Chiltern* hills on a firm fast ground, having the Hills themselves as a sufficient direction: Which is all worth notice of it, but that it passes through no *Town* or *Village* in the *County*, but only *Goreing*; nor does it (as I hear) scarce any where else, for which reason 'tis much used by stealers of Cattle: and secondly, that it seems by its *pointing* to come from *Norfolk* and *Suffolk*, formerly the Kingdom of the *Iceni*, from whom most agree (and perhaps rightly enough) it received its name *Icenild*, or *Ikenild*; and to tend the other way West-ward, perhaps into *Devon-shire* and *Cornwall*, to the *Lands end*. So much mistaken is Mr. *Holinshed* in his description of this way^y, who fancied it began somewhere in the *South*, and so held on toward *Cirnecester*, and thence to *Worcester*, *Wicomb*, *Brimicham*, *Lichfield*, *Darby*, *Chesterfield*, and crossing *Watling-street* somewhere in *Tork-shire*, stretched forth in the end to the mouth of the *Tine* at the main *Sea*. Yet the Learned Mr. *Dugdale*^z seeming to favor this opinion in his description of *Ickle-street* that passes through *Warwick-shire*, I suspend my judgement till I have seen more of both.

24. Amongst the many *Vicinal ways*, or *Cheimini minores*, we have but one neither here, of all those mentioned by *Antoninus* in his *Itinerary*, and that is part of the *Gual-Hen*, which signifies in Brittainish *antiquum Vallum*, that went between *Pontes*, now *Colebrook*, and the old City *Caleva*, or rather as it was written in the ancientest Books, *Gallena*^a; to which our Fore-fathers adding the word, *Ford*, by reason of the shallowness of the River there, and changing the letter *G* into *W* (a thing frequently done by the *Saxons*^b) it was at length called *Wallengapord*, now more contractedly *Wallengford*.

25. Which 'tis plain stood not formerly where it now doth, this old *Vallum*, or high ridged way, pointing down from between *Mungewell* and *Nuneham-Warren* on *Oxford-shire* side the River, as described in the *Map*, near a mile below the *Town* as it is now seated; whereabout, in all likelihood, on the other side the River stood that part of the *City* containing the 12 *Parishes*, laid desolate by a great *Plague* that reigned there, *temp. Edw. 3*. Which

^y *Raph. Holinshed's description of Britan, lib. 1. cap. 19.* ^z *Antiquities of Warwick-shire in Barlick-way Hundred, pag. 568.* ^a See *Burton's Commentary on Antoninus his Itinerary. Itinere 7. à Regno Londinium.* ^b See *Rich. Verstegan's Antiquities of the English Nation, cap. 5. sub finem.*

great blow it could never recover (though much endeavored by *Rich. 2.*) the Bridges of *Abington* and *Dorchester* being also about that time built, which diverted the Trade another way, whereas before there was no passage over the *Thames* but here at *Wallengford*^c.

26. This *Vallum* or ridged Bank, now called *Grimes-dike*, as it runs towards *Pontes*, yet remains very high, but is but single till it comes to the Woods near *Tuffield*, alias *Nuffield*, where it appears double with a deep *trench* between, like the ways near *Piperno* and at *Porto* in *Italy*^d; which induces me to believe, that that part next *Wallengford* was once so too, and therefore still called *Grimes-ditch*, the *trench* in all likelihood being filled up with one of the *banks* thrown into it upon the increase of *Agriculture*, perhaps at first designed only to carry off the *water*, and the two *banks* on each side for the *carriages* 'twixt the *stations* *; those from *Wallengford* to *Pontes* going upon one *Bank*, and those from *Pontes* to *Wallengford* upon the other, so that there could be no disturbance by meeting on the way. From *Tuffield*, I was told, it held on its course through the thick Woods, and passed the *River* below *Henly* into *Berk-shire* again, but the Woods scarce admitting a *foot* passage, much less for a *Horse*, I could not conveniently trace it any further.

27. There seems also to have been cast up another *Roman way*, between the old City of *Alcester* in the Parish of *Wendlebury* (of which more anon in its proper place) and the City of *Calleva*, whereof there is part to be seen to this day running quite cross *Otmoor*, as described in the *Map*, and coming out of the *Moor* under *Beckley Park-wall*; which 'tis plain, has been paved (as indeed it had need) by the stones yet found upon, and about the *ridge*, and no where else on the *Moor*. From *Beckley* it passes on to, and may plainly be seen in the *Wood* near *Stockers*, where cutting the *London* road to *Worcester*, it goes plainly through the *fields* to *Stafford-Grove*, and thence over *Bayards* watering-place, toward *Heddington Quarry* pits, leaving *Shotover-hill* on the left, and the *Pits* on the right hand.

28. At the foot of *Shotover-hill* it enters *Magdalen College Coppices*, and thence through *Brasen-nose College Coppices*, over the

^c Vid. Lelandi Comment. in Cygneam Cantionem in verbo Calvea. ^d Vid. Leon. Bapt. Alberti de re Aedific. lib. 4. cap. 5. * Ibidem.

Eastern part of *Bullington-green*, as I gather by its pointing, for it is not to be seen there, it having been ploughed down as well in the *green*, as *fields* thereabout, as may be seen by the marks of the *ridge* and *furrow* yet remaining upon it; whence I guess it passes on towards the two *Baldens*, and so for *Wallingford*; going over the River at *Benson*, alias *Bensington*, where it may be seen again running *West* of the *Church*, and is there called by the name of *Medlers-bank*.

29. If it be asked why this way 'twixt *Wallingford* and *Alcester* was laid so crooked? it is plain, 'twas for the convenience of taking *Oxford* in the way as occasion should serve. For though I could not discover the *divericulum* tending toward *Oxford* in the way from *Wallingford*, yet in the way from *Alcester* it remains at some places yet plain and evident, coming out of the main road about the Parish of *Beckley*, and passing more *Westward* through *Stow-wood*, and more particularly through the grounds still called *Principal* (for that they were formerly the *Principal Coppices* before the dis-forreſting that *Wood*) where the way is to be seen entire and perfect, having formerly been *paved*, as appears by a *ditch* cut through the *bank* in a division of these grounds, where the stones lie *arch-wise* in form of the *bank*, there being none neither like them in the *fields* thereabouts.

30. Coming almost as far as *Elsfield*, where it is now deeply trenched between two *banks*, like some part of *Grimes-dike* mentioned above, it is broken down and discontinued, I suppose by *ploughing*, but points just upon *Heddington*, whereof the *hollow lane* ascending into the *Town*, near Mr. *Pawlings* new Buildings, perhaps may be a part; and the *deep way* between two green banks a little on this side *Heddington*, another; and the hollow way on the brow of *Heddington-hill*, another piece of it. Out of which there seems also another way to have branched about the top of the hill, which passing through the grounds 'twixt that and *Marſton-lane*, where it is plain to be seen, by its pointing shews as if it once passed the River above *Holy-well Church*, straight upon St. *Giles's*, or the old *Belloſitum*, now *Beaumont*; where about *Thomas Rudburn* in his *Chronicon Hydenſe*, ſays, anciently before its reſtoration by *Ælfred*, the *Univerſity* was ſeated: *Quæ Univerſitas Oxoniæ quondam* (ſays he, having before diſcourſed of its reſtoration by *Ælfred*) *erat extra Portam Borealem ejusdem Urbis, & erat*

erat principalis Ecclesia totius Cleri, Ecclesia Sancti Ægidii extra eandem portam *. Which two put together, perhaps may make as much for the *Antiquity* of this place, as need be brought for it.

31. Beside, this *branch* out of the way 'twixt *Alcester* and *Wallengford* pointing toward *Oxford*, I must not forget there is another that seems designedly made for a passage hither immediately from *Alcester*, whereof there is a part still remaining about *Noke*, whence it passes through the *fields* to the *purlue* grounds, where it cuts the *Worcester* road, and so into *Drunsbil*, formerly a part of the *Forrest* of *Stow-wood*, where about fourteen years since there were several *Roman Urns* and *Coins* dug up; beyond which place I could not trace it, it being ploughed down in the following grounds, which yet is the best conjecture I can make of it, unless we shall rather say it was only laid this way to avoid *Otmoor* in the *winter* season, when it is usually under water; and that it turned about again (as indeed it seems to point) and joyned with the foremention'd to *Wallengford* and *Oxford*.

32. Nor must it be omitted, that the people hereabout call that part of this way that lies through *Otmoor*, by the name of *Akeman-street*, supposing it to have come from *Wallengford*, and to have passed on by *Alcester* to *Banbury*; to which name of theirs, and course of the way, Mr. *Camden* seems to afford his tacit consent: wherein I wonder they, but more that he, should be so much or'e-seen, since he could not but know, that neither end of such a way could tend toward *Bathe*, the old *Æce-manner-cearpen*, or *Urbs Ægrotorum hominum*; nor they, that the true *Æce-manner-ſtæræ*, comes near indeed to *Alcester*, but passing through the *County* quite another way, both the *City* and way leading to it, having their names from the *sick persons*, or *men* with *aches*, travelling on it thither.

33. The true *Akemanstreet* then, or as some call it *Akehamstreet*, and others *Akermanstreet*, coming out of *Buckingham-shire*, enters this *County* at a Village called *Black-thorn*, whence it passes on without any raised bank, close by *Alcester* as far as *Chesterton*, as described by the shaded or *pointed* lines in the *Map*: whence it goes to *Kirklington* Towns end, and so over the River *Cherwell* near *Tackley*, and thence in a straight line to *Woodstock-Park*, which it enters near *Wooton-gate*, and passes out again at *Mapleton-well*

* *Chronicon Hydense MS. inter xxiij. & Oxoniens.* ° *Vid. Camd. Britan. in Comit. Oxon.*

near *Stunsfield* stile, whence it holds on again as far as *Stunsfield*; and all this way on a raised *bank*, as described in the *Map* by two parallel lines; where breaking off (but still keeping its name) it goes on over the *Evenlode* to *Wilcot*, and so to *Ramsden*; a little beyond which *Village*, at a place called *Witty-green*, it may be seen again for a little way; but from thence to *Astally*, over *Astall-bridge*, and so through the fields till it comes to *Brodwel-grove*, it is scarce visible, but there 'tis as plain again as any where else, holding a straight course into *Glocester-shire*, and so towards *Bath* the old *Akemancester*.

34. And out of this *Akemanstreet*, as most other such ways, there are several *branches*; viz. two near *Kirklington*; one at the *Towns* end, which though presently discontinued, yet points just upon the *Port* way running *East* of *Northbrook*, the two *Heyfords*, *Sommerton*, and *Souldern*, for six miles together; and another, that by its pointing seems to have come out of *Akemanstreet*; nearer the place where it passes the River *Cherwel*, crossing the *Port way*, and running at the broadest place, scarce a mile distant from it, as far as *Fritwell*, where on the *North* side of the *Town* it inclines toward the *Port way*, as if it joyned with it again somewhere about *Souldern*, both of them pointing upon the *Fortifications* called *Rainsborough* (perhaps a corruption of *Romansborough*) near *Charleton* in *Northampton-shire*: whence in all probability it went to *Vennonis*, alias *Bennonis*, an old *Roman station*; by the *Saxons* after called *Claycester*, in the confines of *Warwick* and *Leicester-shires*; and so on to the *Ratæ* of *Antoninus*, or *Ragæ* of *Ptolomy*, now *Leicester*^f.

35. This second *branch* of *Akemanstreet*, about *Fritwell* they call *Wattle-bank*; but in an old *Terrier* of Sir *Thomas Chamberleyns*, it is called *Avesdich*, perhaps a corruption of *Offa's-ditch*, the great King of the *Mercians*, whose *Kingdom* might at first be terminated here, though I find he extended it at length as far as *Benson*, as thinking it for his *honor* and *profit* both, that the *West-Saxons* should have nothing *North* or *West* of the *Thames*^g. Or if ancients than *Offa*, it might perhaps be a *prætentura*, or forefence of the *Romans*, raised against the *Britans* (or *vice versa*) who might possibly be possessors of the *Port way* before.

36. Yet I rather believe they might be both of them ancient

^f Vid. *Ptolomæi Geograph. Edit. per Pet. Bertium.* ^g Vid. *Camd. Britan. in Com. Oxon.*

ways, though so near together, for we read that the *Romans*, where the way was not well laid out, or was longer than needed, did commonly (to keep the people from *idleness*, and the *Soldiers* from *mutinies*) lay them *straiter* and better; as *Galen* witnesseth that *Trajan* did in *Italy*: *ἔνθα δ' οὐδὲ μῆκος ἢ ἀρροχίντως ὁδὸς ἦν, ὅταῦντα αὐτοῖσι ἐπείαν τεμνόμεναι*^h, i. e. that where the way was longer than needed, he cut out another shorter, which possibly might also be done here, the *Port way* being much shorter and more direct than *Avesdich*, to the place whither they both seem to hold on their course: which may also be the reason of the two *Ikenild ways* under *Stoken Church* hills, there being about *Lewkner* and *Aston Rowant*, an upper and lower *Ikenild way*.

37. Beside these, there are yet two other branches coming out of *Akemanstreet*; one in *Woodstock Park* near Col: *Cooks Lodge*, whence it runs toward the trees called *Oak* and *Ash*, not far from *Glympton*, where it is discontinued; and where to be met with again I could no where find; so that all I can say of it is, that towards the end it points *North-west* towards *Enston* and *Chippingnorton*, and seems to have cut another such like way near *Upper Kiddington*, which has its *period* there, as far as I could learn, but runs as far as *Ditchley* the other way, where the ridge turns to a ditch by the name of *Grimes-dike* (as that near *Wallengford*) and gives name I suppose to *Ditchley* that stands upon it, a *Seat* of the Right Honorable *Edward Henry Earl of Lichfield's*, whence it runs in that manner fair and visible for about half a mile; but before it comes to *Charlbury*, turns again to a ridge, very high and lofty at a place called *Baywell*, where it enters into *Cornbury Park* but scarce visible there; yet as I was told, to be found again in the woods beyond it, and that it pointed toward *Ramsden*, where at first (as I guess) it branched out of *Akemanstreet*.

38. But whether this, and the other before-mentioned tended, is hard to guess, no *Roman station* lying near this place, unless I may be allowed to conjecture by their pointing, at a great distance, which must needs be very uncertain. However, because a guess perhaps may better please than to say nothing, I conjecture the way by *Ditchley* may tend either toward *Vennonis*, and *Ratae*, as the *Port way* and *Avesdich* afore-mention'd were thought to do, or else toward *Tripontium*, now *Toucester* in *Northampton-shire*;

^h Γαλῆνις ἡγεωγραφικῆς μετρίου. βιβλ. δ'. κεφ. 4.

and that from *Woodstock* toward *Manduessedum*, now *Manchester* in *Warwick-shire*, or rather the old *Etocetum*, now the *Wall* in *Stafford-shire*.

39. Which are all the *raised banks* or deep *trenches* that I met with in *Oxford-shire*, except the two *banks* with a *trench* between them (therefore called *dike-hills*) South and by West of *Dorchester*, which I cannot imagin part of any *Roman way*, because extended only as a *string* to a great *bow* of the River *Isis*, as described in the *Map*; but rather a *Fortification*, such as *P. Ostorius Propraetor* here in *Britan* under *Claudius*, is said by *Tacitus* to have made on the Rivers *Antona* and *Sabrina* *; or else some of the *Outworks* of the *Fortifications* on *Long-Witenham* hill on the other side the water, which perhaps was the *Sinnodunum* of the ancient *Britans*.

40. Nigh to the *raised ways* thus cast up by the *Romans*, they placed the *Tumuli*, or *Sepulchres* of their *Generals*, or such other valiant persons as dyed in the *wars*; it being forbid by the Law of the 12 *Tables* to bury within their *Cities* or *Stations*. *Hominem mortuum in Urbe ne sepelito neve urito*^k: And by a *penal Rescript* of the *Emperor Hadrian*^l. Now the reason why they placed them on the *military ways*, rather then elsewhere, is given us by *Camden*, viz. that *Passengers* might be put in mind, that as these here buried were somtimes mortal men, that they themselves are no better now^m: whence perhaps the *formula* still used on *Tombs*, *Siste Viator*, and *monumentum à monendo*.

41. But I guess that there could not but be somewhat more in't, for as it was accounted the greatest *dishonor* imaginable to lie *unburied*, so it was a great *reputation* to the *person* deceased to be cover'd with a large *Tumulus*, which 'tis like might in part at least be the reason of their placing them so near the *public ways*, that *Passengers* might continually add to the *heap*, it being look'd upon as *piety* in them so to do; nor sufficed it to throw on a single handful of earth, but (as may be collected from *Horace*) usually three. For in *Archytas's* request to the *Mariner*, that he would not suffer his Body any longer to lye on the *shoar* unburied, he makes it part of his *plea*, that notwithstanding the swift motion of *Seamen*, yet he might find time enough to throw 3 handfuls of dust.

* *Taciti Annal. lib. 12. cap. 31.* ^l *Vid. Leland. Comment. in Cygneam Cant. in verbo Sinnodunum.*
^k *Ex Legibus 12. Tab. de Jure Sacrorum. Vid. etiam Cicer. de L. L. lib. 2.* ^l *ff. De Sepulchro violato. L. Prætor ait, §. Divus Hadrianus.* ^m *Vid. Camdeni Britan. in Com. Wilts.*

*Quanquam festinas, non est mora longa, licebit
Injuncto ter pulvere curras* ⁿ.

42. Which way of *burial* under *Conical hillocks*, whether naturally composing themselves into that *Figure* by the fall of the *Earth*, or designedly so made by the *Soldiers*, was sure very ancient; for from their being placed without *Cities*, I find them called by the *Greeks*, *ὑπερπύλοιοι λόφοι*, and upon *High-ways*, *Ερμαῖοι*, for that the God *Mercury* had the charge of *ways*; as his other name *Ενὸδιος* likewise imports.

Ἡδὴ ὑπὲρ πύλου ὅτι Ερμαῖος λόφος ἐστὶ.

We find also *Achilles* in *Homer*, complaining how small a *Tumulus* he had made for his beloved *Patroclus*,

Τύμβον δ' ἔμαλα πολλὸν ἐγὼ πονέεσθαι ἄνωγα
Ἀλλ' ὅππαιεα Ἴδιον, ^p δευ.

and intreating *those* should come after to raise it higher, which desire of his was piously performed by the succeeding *Greeks*, who raised it to so great a height, that they designed it for a *Sea-mark* to those that should sail the *Hellefont*.

μέγαν καὶ ἀμύμονα τύμβον
Χόαντος Ἀργείων ἱεροῦ σταπὶς. ^Θ 9.

and this I find here, and at all other places, they always performed *χόαντες δὲ θ σήμα* ¹; and so again in the erection of the *Tumulus* over *Hector* ², by pouring on *earth* or *stones*; the word *χέαν* as *Eustathius* informs us, being sometimes used absolutely, *προ γὰρ ὅτι χέαν τῆς τεθνεώσις*. ^{i. e.} (in the most critical sense) for *humare*.

43. It was also very ancient amongst the *Romans*, not only for *Princes*, as *Virgil* witnesses,

*fuit ingens monte sub alto
Regis Dercenni terreno ex aggere bustum.
Antiqui Laurentis, opacaque Illice testum* ^u.

with whom agrees *Lucan*,

Et regnum cineres exstructo monte quiescunt ^w.

ⁿ O. Horatii Flac. Carminum, lib. 1. de 28. ^o Hom. Odyss. β. π. v. 471. ^p Hom. Iliad. β. π. ψ. v. 245.
¹ Hom. Odyss. β. π. v. 80. ² Hom. Iliad. β. π. ψ. v. 257. ³ Ibid. β. π. v. 801. ⁴ Vid. Eustathii Schol.
in Hom. ^v Æneid. lib. 11. v. 850. ^w Av. Lucani Pharsalia sive de bello Civili, lib. 8. sub finem.

but also for meaner persons ; for thus we find *Æneas* burying his Nurse *Cajeta*,

At pius exequiis Æneas rite solutis.

Aggere composito tumuli, &c.^x.

Nay so very ancient was it, that *Pliny* says expressly, it was long in use amongst them before *Burning*, *Ipsum cremare apud Romanos non fuit veteris instituti ; terra condebantur, i. e.* that they always interred them, till they began to understand that the bodies of their men slain in the wars afar off, were sometimes taken forth from under their *Tumuli*, and barbarously abused^y, as *Florus* acquaints us the Germans served the body of the Consul *Varus*, amongst other indignities offer'd the Romans : *Ipsius quoque Consul's Corpus, quod militum pietas abdiderat, effossus*^z.

44. To prevent which barbarity for the future, they ordained burning before tumulation, as was used always amongst the Greeks ; for we find in *Homer*, that the body of *Hector* (as well as *Patroclus*) was first burned, and his calcined white bones then gathered by his Friends and put in an *Urn*.

Ὅσέα λούει λέρνῃο κασίγνητοι ἑταερί τε^a &c.

and then follows their raising a *tumulus* over him, which it seems was of stones,

αὐτὰρ ὕψθε

Πυκνοῖσιν λατοῖσι καί τε σφόνδα μεγάλοισι^b.

and yet expressed as where made of *Earth*, by pouring them on, *Χεύδοντες ὃ τὸ σῆμα*^c.

45. It was a usual custom also amongst the Northern Nations, in their second Age, which they called *Hoigold*, or *Hoelt tijd*, *Tumulorum Ætas* ; thus to bury their dead under earthen hillocks, *Arenam & terram exaggerando usque dum in justam monticuli exsurgent altitudinem*, says *Wormius* of the Danes^d ; and of these he says they had two sorts, the *Rudiores*, which, *ex sola terrâ in rotunditatem & Conum congesta constabant, i. e.* that were made only of *Earth*, cast up in a round conical figure, which were set up in memory of any stout Champions that had deserved well of their

^x *Æneid. lib. 7. v. 5.* ^y *Plin. Secund. Nat. Hist. lib. 7. cap. 54.* ^z *L. An. Flori Rerum Rom. lib. 4. c. 12.*

^a *Hom. Iliad. β. v. δ. v. 793.* ^b *Ibidem v. 797, 798.* ^c *Ibidem, v. 801.* ^d *Olai Wormii, Monument. Danic. lib. 1. cap. 7.*

Country. And the *Ornati*, which were encompassed with a circle of stones, set up only for their *Generals*, or some other great *Persons* ^c.

46. And these they set over the Bodies without burning them (as they had formerly done in their *first* age, which they called *Roisold*, or *Brende tijd*, *Ætas ignea* ^f) the manner being as Mr. *Camden* informs us, for every *Soldier* remaining alive after a *field* fought, to carry his *head-piece* full of *earth*, towards making the *tombs* of their *fellows* that were slain ^g, *Χεύοντες δὲ τὸ σῆμα, fundentes tumulum*, after the manner of the *Greeks*.

47. But the *Romans* here in *Britan*, having little reason to expect more favor then they found in *Germany*; whenever any *Consul*, or eminent *Warrior* dyed in such an *Expedition*, first burned them on the level near the *via strata*, or *militaris*; by which means having deprived their exasperated *Enemies* of all hope of being able to abuse the dead *bodies*; they more-over endeavored to prevent the very scattering their *ashes* in hast, the whole *Army* casting on them pure *grassy turfs*, cut from the surface of the ground, which probably indeed may be the very reason (as the learned and ingenious Mr. *Dugdale* ^h guesses) why there appears not any hollowness whence the *earth* was taken that raised these *Tumuli*.

48. Whereof here in *Oxford-shire* I have met with two kinds; one placed, as above, on the *Prætorian ways*; and the other sort not so, yet both commonly called *Burrows*, alias *Barrows*, from the *Saxon* *Beorrg*, *collis*, *acervus*, whence our word to bury ⁱ. Hence also the *raised banks*, made for *Conies* to hide themselves, says Sir *Henry Spelman*, were also called *Berries* ^k. Of the first sort is the *hillock* in the Parish of *Fritwell*, called *Ploughly-hill*, standing just within *Oxford-shire* on the *Port way*, and (which is somewhat more then ordinary) giving name to the *Hundred* wherein it stands.

49. And there is another on the West side of that branch of *Akemanstreet* that comes out of *Woodstock Park*, close by the *Rivulet* over which that way passes; but the most eminent on *Akemanstreet*, is that they call *Astall Barrow*, standing high and lofty, which I conceive might be the *Sepulcher* of some considerable per-

^c *Ibidem* lib. 1. cap. 6. ^f *Ibidem* cap. 7. ^g *Vid. Camd. Britan. in Com. Wilt.* ^h Mr. *Dugdale's* *Antiquities of Warwick-shire*, in *Knightlow Hundred*. ⁱ *Vid. Guliel. Somneri, Dictionar. Saxonico-Latino Angl. in verbo.* ^k *Vid. Spelmanni Glossarium in verbo Berghum.*

son, at least of great repute amongst the *common people* that pass that way; there being another, not far off upon the same way, on the edge of *Oxford-shire*, incomparably less.

50. Upon these their *High-ways* it was also usual amongst them to place *pillars* of *stone*, whereon they inscribed the distances from the *regal Cities*, *Stations*, and *Mutations*, whence the phrase, *ad tertium, quartum, vel quintum, ab Urbe lapidem*, i. e. so many miles from the *City*. And of these I think the *stone*, that yet lies on a bank close by *Akemanstreet* way, not far from *Astall Barrow*, to have been a remnant, and most likely of any the *pedestal* of such a *Pillar*: unless we shall rather think it to have been a *pedestal* to a *Statue* of *Mercury*, made with *four sides* and without *arms*, from thence called *πτερόγωνος, κωλός*, or *Cyllenius*¹, and in old time *Hermæ*, which were also used every where to be set up near *high-ways*; and if in *cross roads*, with as many *heads* as there were *ways*, *ut interdum etiam quatriceps conspiceretur*^m.

51. Whatever it were, no doubt this, and the fore-mention'd *Barrows*, were of *Roman* erection; but as for *Kenners Barrow* near *Sbington* under *Which-wood*, the large *Barrow* at *Stanton-Harcourt*, and that other (if it be one) called *Adwel Cop*; I think rather erected by the *Britans* or *Danes*, for that near no *high-ways*, but in the open fields, as *Saxo-Grammaticus*ⁿ, and *Wormius* say they made them: *Non solum in campis & pratis occurrunt Tumuli, sed & in Silvis & Lucis, &c.*^o i. e. that they have them not only in the *fields* and *meddows*, but in the *woods* and *groves* too.

52. More particularly, as for *Kenners barrow* and *Adwel cop*, I think them erected but for inferior *Captains*, though perhaps eminent *Soldiers*, because they are of the *rudiores, ex sola terra*: But for that at *Stanton Harcourt*, if a *Danish* Monument, it was certainly a memorial of some greater *Person*, because of the *stones* set near it, of which more anon in another place: though it be possible too that these may be *Roman*, it being customary for them to set up such *Trophees*, at the utmost bounds of their *Victories*, or where they could not conveniently advance them further, as *Dion* testifies, the *Roman General Drusus* did at the River *Albis*, *τρόπαια ἑτάθη ἀνέχοντες*^p, i. e. that he set *Trophies* and returned: which *Trophies* of his, *Florus* says expressly, were only a *Tumulus*: *Nam Mar-*

¹ *Levini Torrentii Comment. in Horat. Flac. lib. 1. Ode 10.* ^m *Ibidem.* ⁿ *Saxonis Grammatici Hist. Danica, lib. 8.* ^o *Olai Wormii Monument. Danic. lib. 1. cap. 6.* ^p *Dionis Cassii Rom. Hist. lib. 55. sub initium.*

comannorum spoliis insignibus quendam editum tumulum in Trophæi modum excoluit, are his very words^a concerning the same Expedition of Drusus.

53. However it were, 'tis certain the *two* former of *these*, are much different from those erected on the *via militares*, for I found them *trenched* round, and particularly that of *Adwel cop*, with two or three *circumvallations*, part whereof are still visible on the South-east side of it, insomuch that I question whether there were not some *Camp*, with this *Trophie* perhaps of *Victory* erected within it, of which more anon when I come to speak professedly, of the ancient *Fortifications* yet remaining in this County.

54. Of other *Roman Antiquities* that I can certainly call such, the most eminent I met with is a part of their *pavement* made of small *bricks* or *tiles*, not much bigger than *dice*; whereof the *Roman Generals*, amongst their other *baggage*, were used to carry a quantity sufficient to pave the place, where they set the *Prætorium* or *Generals Tent*, or at least some part of it, which is particularly witnessed of *Julius Cæsar*, *In expeditionibus tessella, & scætilia pavimenta, circumtulisse*^b.

55. These if made of small square *Marbles*, of divers *natural* colours, were called *Lithostrota*; but if of small *bricks* or *tiles*, artificially tinged with colours, annealed and polished, *Pavimenta tessellata*, or *opus Musivum*^c; and both *Asarota*^d, for their not being to be swept, but wiped with a *sponge*. As for ours ploughed up somewhere about *great Tew*, and engraven *Tab. 15. Fig. 22*. I take it for certain to be of the second sort, it consisting of a matter much softer than *Marble*, cut into *squares* somewhat bigger than *dice*, of four different colours, viz. *blue, white, yellow, and red*, all polished, and orderly disposed into *works*; the colours of the *squares* being represented in the *Cut*, as those of the *Arms* in the *Map*.

56. There was much such another *Pavement* ploughed up at *Steeple Aston*, consisting likewise of *squares* of divers colours, and set in curious *figures*, but as described to me by the Reverend Mr. *Greenwood*, Rector of the place, not *cubick* like the former, but *oblong squares* set perpendicular to the *Horizon*. That these *Pavements* were *Roman*, I think there's no doubt, notwithstanding

^a L. An. Flori Rer. Roman. lib. 4. cap. 12. ^b Suetonius in vita Julii Cæsaris. ^c Salmastii Annot. in Sueton. in vita Julii Cæsaris. ^d Plin. Sec. Hist. Nat. lib. 36. c. 25.

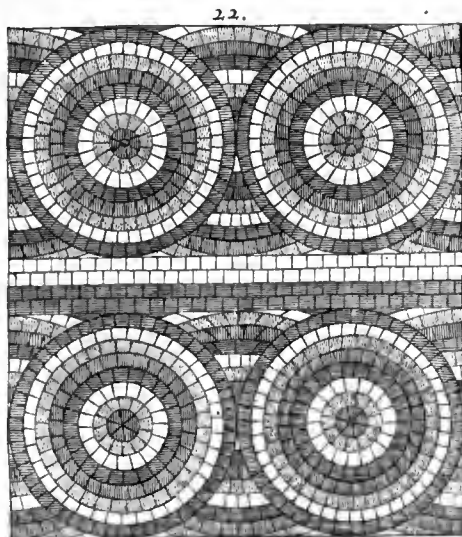
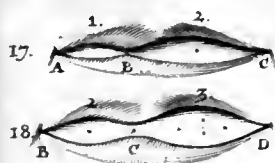
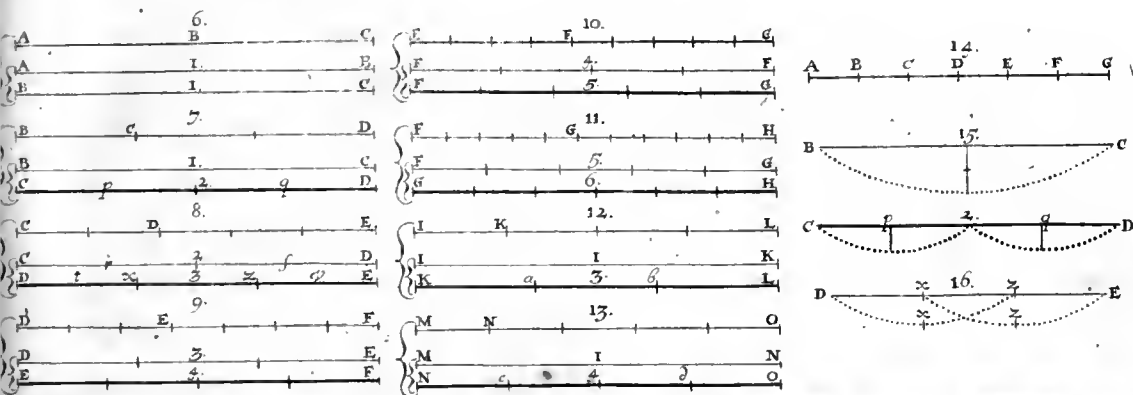
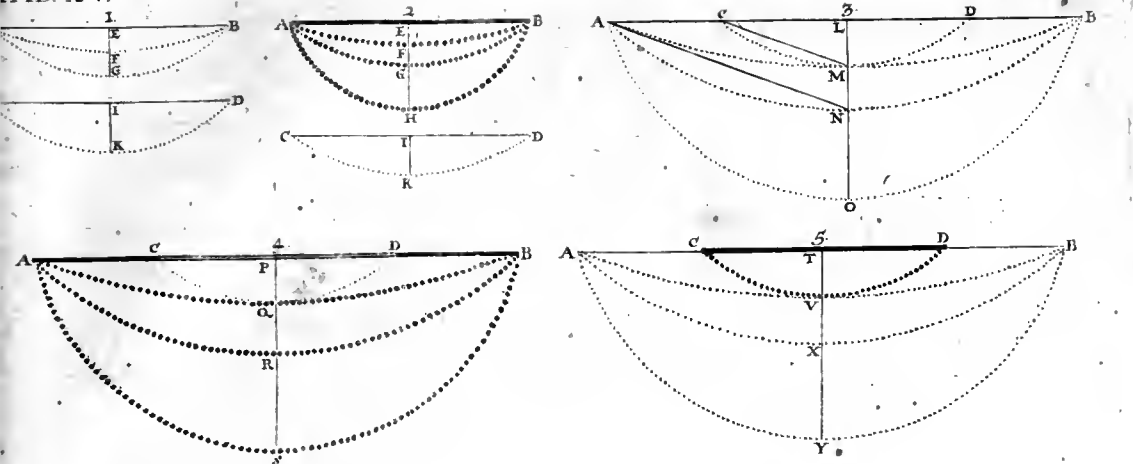
ing found near no *Roman station*, and far enough removed from any *Roman high-way*; (except the *branches* of *Akemanstreet* from *Ramsden* and *Woodstock*, might happily pass these places:) but I guess not set here till they wholly possess themselves of this *Southern* part of *Britan*, and might securely enough pass their *Armies* any where; and therefore cannot afford them any higher *antiquity* than the time of *Agricola* the *Lieutenant* of *Vespasian*, who compleated the *Roman Conquests*; or at most of *Paulinus*, that defeated *Boadicea*.

57. Under the *Sepulchral monuments*, or *tumuli* afore-mentioned, raised by the *Romans* over their *dead* in memory of them, they placed the more immediate receptacles of their *ashes*, or at least some part of them, as much as could be saved in the *Vasustrinum*; for they were not so curious as some have imagined, to scrape together all the *bones* and *ashes* of the *Corps*, as may be easily collected from the smallness of all *Urns*, but *Family ones*. Yet over all their *Urns* they raised not such a *tumulus*; for we find them many times in *level ground*, though containing the remains of *noble Persons*, as may be guessed by the *Lamps*, *Lachrymatories*, and *Vessels* of *Oyls*, or *Aromatical Liquors* sometimes found with them.

58. Of which sort of *Vessels*, I presume that odd fashioned *glass*, depicted *Tab. 15. Fig. 23.* must needs be one, found in a place called *bushy Leas*, betwixt *Brightwel* and *Chalgrave*, being part of the possessions of that right worthy Gentleman, *John Stone of Brightwel Esq;* surrounded with no less than twelve of those *Urns*, *Tab. 15. Fig. 24.* both which, amongst many other signal favors, were kindly bestowed on me by the same worthy person. That the *Earthen pot*, *Fig. 24.* is a *Roman Urn*, I take to be so plain, that it would not need proof, though one of the four *Regal high-ways* were much farther removed than *Ikenild way* is, which comes up almost to *EWELM*, not far from this place. But whether this *glass* contained a *lamp*, were a *Lachrymatorie*, or a *vessel* containing *water*, or some *Aromatical liquor*, is the great question next to be determined.

59. That the Bodies of great Persons were usually accompanied with *Lamps* after death, is plain from the *Civil Law*^a, and to inter *Lamps* with them, was heretofore so frequent, that *Fortunius Licetus* has written a whole Book, *De reconditis Antiquorum*

^a ff De Manumissis Testamento, L. *Marvia*.



Lucernis, amongst which he mentions one out of *Baptista Porta*, called *Lucerna Nesidea* (from the Island where found in *Cratere Neopolitano sita*) which was included within a *glass*, and placed in a *Marble Tomb*^w, upon the same account (I suppose) that indeed all others were; both as a Symbol of the quality of the person there interr'd, and for the sake of the *soul*, which they thought did not so quite desert the *body*, but that it rested with it in the grave^x.

60. But that ours was such a *glass* including a *lamp*, I dare not conclude, more than that it is barely possible it might be so, it seeming much rather likely to have been a *phiale Lachrymatoria*, or *tear-bottle*, wherein the surviving Friends of the deceased, collected those passionate expressions of their grief, and usually buried with them, as is sometimes signified in old *Inscriptions*, by some such expression as, *Cum lachrymis posuere*^y; only it is of a much different figure from any of those described in *Job. Bapt. Casalius*^z, and *Paulus Aringhus*^a.

61. And therefore I rather believe it to have been one of those *vessels* containing some *Aromatical liquor*, such as they usually interred with the *Urns* of *Noble Families*^b, and perhaps a *glass* of the same kind with those three found in a *Roman Urn*, preserved by Cardinal *Farnese*, and mentioned by *Vigeneri*^c: Except we shall rather think it the *vessel* for the *Aqua lustralis* sprinkled by the *Priest* on the *Urns*, to expiate for the smaller faults of the deceased^d, which possibly they might after bury with them, which *waters* were otherwise called *arferiæ aquæ*, and by the *Greeks*, *ἁδονία λυγρὰ*, or *ὕδωρ ὅτι τοῖς νεκροῖς σπενδόμενον*^e: But I rather incline to the former of the two, because there seems a kind of *white substance* yet remaining between the two coats of the *glass* (it being a *vessel* of a peculiar make, one *glass* as it were including another) which possibly might be the *sediment* of some such *Aromatical liquor* when dried away.

62. Also in the Parish of *Wendlebury* I saw a great *square stone*, hollowed round in the middle, dug up in or near the old *City of Aldcester*, in which there was set a *glass bottle* fitted to it, containing nothing but somewhat like *ashes*, and cover'd over above

^w *Bapt. Portæ Magiæ Nat. Lib. 12. cap. ult.* ^x *Fortunii Liceti de reconditis Antiquorum Lucernis, Lib. 3. cap. 6. & 7.* ^y *Vid. Johan. Bapt. Cassalium de Urbe, & Ritibus Romanorum, cap. 21.* ^z *Ibidem.* ^a *Pauli Aringhi Roma subterranea, lib. 3. cap. 22.* ^b *Sir Thomas Brown's Hydriotaphia, cap. 3.* ^c *Ibidem cap. 2.* ^d *Job. Bapt. Casalius de Urbe & ritibus Romanorum, cap. 22.* ^e *Vid. Job. Meursium de funere, cap. 14.*

with another broad flat *stone*: This *Urn* I saw at a house in the *Town*, where 'tis used for a *Hog-trough*, but the *glass* had been broken long before, nor could I get any certain description of it; however, I guess it some such like *vessel* with that described above, and placed there upon the same or like accounts. There have been several other *Urns* also taken up at divers other places, particularly in the old *Mine* at *Blunds Court* above-mention'd, *Chap. 6. §. 63.* at a place called *Drunsbil* not far from *Wood-Eaton*, but belonging, as I was told, to the Parish of *Marston*, near the ridged way that comes from *Noke*; and three in one Mr. *Finches* house at the *Mercat-place* in *Henly*, and one in the high-way that leads towards the *North* at the *Town's* end, not far from *Ancaſtle*, which argues those places some of the first *Roman habitations*, though no recorded *garifons*.

63. Nor indeed is there any such to be found in this County, though it cannot but be acknowledged that *Oxford* it self must be a noted place, before the departure of the *Romans* at least, if the *Roman* way thither described in the *Map*, prove so good an argument to the *Reader* as my self. Where by the way perhaps it may not be unworthy notice, that *Oxford* is mention'd by the *Arabian* Geographer, *Sharif ol' Edrîſi*, or *Adrîſi* (of whose works the *Geographia Nubiensis* translated by *Gab. Sionita*, and *Joh. Hezronita*, is too short an *Epitome*) by the name of *عزقfort* *Ozcfort**, withal adding, that it stands on the same river with *London* (which river he calls *رطاندہ* *Retandah*†) 40 miles above it^f, which shews that *Oxford* was always a *Town* of good repute, in the remotest places, as well as times.

64. As for the antiquity of the *University*, beside what was alleged §. 30. of this *Chapter*, I think it very considerable what remains upon record in *Magdalen College Library*, in an ancient MS of *Walter Burley's* Fellow of *Merton College*, (*Tutor* to the Famous King *Edw. 3.* and deservedly stiled *Dr. Profundus*) upon the *Problem* [*Complexio rara quare sanior*] he has these words (which shoudl indeed have been mentioned before, *Chap. 2. §. 3.*

* Perhaps written *عزقfort* *Ozcfort*, (by a transposition of the Letters which many times occurs in words of difficult sound) instead of *عزقfort* *Ozcfort*. † *رطاندہ* *Retandah* seems to be a fault of the Scribe: whereas the Author probably intended to have it read *طاميزه* *Tâmize*, or *Tâmise*. † *Sharif Ol' Edrîſi* Geograph. MS. Arab. penes Reverend. *Edw. Pocock* S. T. P. & *Eccles. Cath. Christ. Oxon. Canonicum*.

of this *Essay*) concerning the *healthy situation* of *Oxford*, and its selection by *Students*, for the seat of the *Muses*: *Notanda*, inquit, *sunt tria, quod Civitas sana est in Borea & in Oriente si plantata est aperta, & in Austro & Occidente si montosa; propter puritatem Boreæ, & Orientis, & putrefactionem Austri & Occidentis: sicut Oxonia, quæ per industriam Philosophorum de Græciâ fuerat ordinata*^s, i. e. that a healthy *City* must be open to the *North* and *East*, and mountanous to the *South* and *West*; by reason of the purity of the two former *quarters*, in respect of the latter: just as *Oxford* is seated, which was selected by the *Philosophers* that came from *Greece*.

65. And that according to the rules of their great Master *Hippocrates*, who requires no other, but the very same situation for a healthy *City*^h. But about what time it was these *Philosophers* arrived, though I dare not be too confident, yet in all probability they might be some of those *Græcians* brought over by *Theodorus* the Greek Arch-bishop of *Canterbury*, about the year 668ⁱ, whom 'tis like he placed here to instruct the *Saxon* youth; for we find *Venerable Bede*, and *St. John de Beverlaco* (alwaies reputed of this *University*) to have been his *Scholars*; and so *Tobias* Bishop of *Rocheſter*, and *Albinus* Abbot of *St. Auguſtins Cant.* who are ſaid to have underſtood the *Greek Tongue* as well as their native one^k.

66. Not to mention that *Britan* was known to the *Greeks* before the arrival of the *Romans*; for otherwise *Polybius* could never have hoped to have deſcribed *Britan*, or the method there uſed in ordering *Tin*, as we find he deſigned, having promiſed to write, *ἡ δὲ Βρετανικῶν νήσων, ἣ τῆς τῆς ἡγεμονίας καὶ τοῦ κράτους*. Which Book though loſt, yet *Strabo*^{*} bears us witneſs, that therein he refuted the Errors of *Dicaearchus*, *Pythias* and *Eratoſthenes*, concerning the magnitude of *Britan*, who were alſo Greek Authors (that it ſeems had written ſomething concerning this *Iſland*) and much ancients than himſelf. Nor to note ſecondly, that the *French Druids* (who had their Learning out of *Britan*) in things of common concern, uſed the *Greek Character*^m; which how

^s In problematibus Aristot secundum laborem Magistri Walter Burley, ad ordinem Alphabeti. MS. 65. in Bib. Coll. B. M. Magdal. Oxon fol. 12 b. ^h Μικροῦ τ' ἀποστολῆς τ' ἡγεμονίας τ' ἡγεμονίας. Hippocrat. Oper. ſect. 3. cap. ⁱ Godwinus de Præſulib. Ang. in vita Theodori. ^k Matth. Parker de Antiquitate Eccleſ. Britan. in vita Theod. ^l Polybii Megal. Historiar. lib. 3. p. 209 Edit. If. Caſaub. An. 1619. ^m Strabon. Geograph. lib. 2. pag. 104. Edit. Caſaub. Paris, An. 1620. ⁿ Jul. Caſar Comment. de bello Gallic. lib. 6.

they should come by without the learning of the Greeks (which possibly might be brought over by some of their *Philosophers* who accompanied the *Merchants* trading for *Tin*, and seated themselves here) let the *Reader* judge.

67. But for the *Bishoprick* of *Oxon*, it is but of late erection, taken out of that of *Lincoln* by King *Hen. 8.* and of no longer standing than his days, notwithstanding what we meet with in the *Decretals* of Pope *Gregory*; where we find two *Rescripts* of Pope *Alexander* the Third, about the year 1158. directed to the Bishop of *Oxon.* and othersⁿ, it being but a mistake (though to be found in all the *Copies*, I could meet with) of *Oxonienſi*, for *Exonienſi*, as plainly appears in the fourth *Book* of the same *Decretals*^o; compared with the places afore-cited.

68. Yet the ancientest *Town* of the whole *County* I take to be *Henley*, so called from the *Brittiſh Hen*, which signifies *old*, and *Lley* a place; and perhaps might be the head *Town* of the people called *Ancalites*, that revolted to *Cæſar*^p: it was also called *Hanleganz* and *Hanneburg*, as appears by an *Inſpeximus* of *Q. Elizabeth*, granted this *Corporation*. And there is a place near it, still called *Ancaſtle* (west of the *Town* where the *Wind-mill* now stands) which is but the *Norman* name, importing the same with the *Saxon Hanneburg*. If it be objected, that *Aldbury* near *Ricot* in this *County* (according to vulgar tradition) is the mother of *Henly*, and conſequentially older; it may be answer'd, that its probable indeed that *Christian Henley* may be younger than *Aldbury*, in reſpect of a *Church* first built there, but upon no other account.

69. And the *Town* of *Watlington* ſeems of no ſmall antiquity, provided its age do but answer its *Etymologie*; for by its name it ſeems alſo to have been an old *Britiſh City*, which according to *Strabo*, were nothing elſe but *groves* fenced about with trees cut down, and laid croſs one another, within which they built themſelves both for themſelves and Cattle. Πόλεις ὅ αὐτῶν εἰσὶν οἱ δρυμοί, περιέξαντες γὰρ δένδρεσι, καταβεβλημένοις κύκλον, καὶ αὐτοὶ ἐν ταῦτα καλυβοποιούντες, καὶ τὰ βοσκήματα κατασκαμδύουσι^q, are his very words: which manner of fence the *Saxons* after called *patelar Crates*, hurdles or wattles, within which mound building them *tents* or co-

^o Decret. de filiis Presbyterorum ordin. & non. c. Proposuit. & de officio, & potest. just. deleg. c. Causam.
^p Decret. qui filii sint legitimi, c. Causam. ^q Julii Cæsaris Commentar. de bello Gallico, lib. 5. ^r Strabonis Geographiæ, lib. 4.

verings, by the Saxons also called *paſel*^r; from one of theſe, or both, I gueſs this Town took its name.

70. As alſo the *Prætorian* or *Conſular* way, called *Watlingſtreet*, and *Wattle-bank* here in *Oxfordſhire*; theſe in all probability being made the ſame way; that *Hadrian* is ſaid to have made *boundaries* (where *Rivers* were wanting) between *barbarous* people; *Stipitibus magnis in modum muralis ſepis funditus jactis atque con-*
nexis^s, i. e. with great *ſtokes* ſet faſt in the ground, and knit together 'tis like with ſmaller wood *woven* between; which if happily made uſe of in theſe ways to keep up the *earth* at firſt, might well invite the *Saxons* to name them *Wattleing-ſtreet*, *Wattle-bank*, &c.

71. Juſt upon the meeting of *Akemanſtreet* way, and the *Port* way from *Wallengford*, there are alſo ſome foot-ſteps of that decayed ancient *ſtation*, by *Camden* called *Alcheſter*, ſtill remaining, which he gueſſes ſo called, as one would ſay an *old Town*^r. But I have met with ſome *notes* in a *MS.* now by me, that ſays it was the Seat of *Aleſtus* the *Emperor*, who having treacherouſly ſlain his Friend and Maſter, the *Emperor Carauſius*, baſely uſurped *Britan* for himſelf, calling this his new Seat after his own name, *Aleſti Caſtrum*, ſince *Alcheſter* or *Aldceſter*: but it ſeems by the ſtory that it flouriſh'd not long, for *Conſtantiuſ Chloruſ* being ſent againſt him by the *Emperors Diocleſian* and *Maximian*, and by the benefit of a miſt, landing privately ſomewhere on the South ſhoar, near the *Iſle of Wight* (whether *Aleſtus* came to prevent it) gave him battle, defeated, and put him to flight towards this his chief *Fortreſs*, but was over-taken and ſlain by *Aſclepiodotus*, one of *Conſtantiuſ*'s *Captains* (as this Author will have it) here at *Elsfield*^u near *Oxon*, (which he alſo would have a corruption of *Aleſtus-field*) before he could reach it.

72. For the credit of this *relation*, it having no foundation in the *Roman* ſtory, I ſhall wholly leave it to the *Readers* judgment; yet ſhall add thus much for its reputation, that the *Roman military ways* lye very agreeable to it; for on ſuppoſition, this *conſlict* happened about *Regnum*, now *Ring-wood*; or *Claſentum*, now *Southampton*; the *Roman ways* lye direſtly thence to *Venta Belgarum*, now *Wincheſter*; and ſo to *Callena*, now *Wallengford*,

^r Gul. Somneri Diſtionarium Saxonico-Lat-Angl. in verbis. ^u Ælius Spartianus in Hadriano. ^t Camd. Britan. in Oxon. ^v MS. penes Authorem.

according to the *Itinerary* of *Antoninus*^w; and thence close by *Elsfield* to *Alcbeſter*, as deſcribed in the *Map*, and in §§. 27. and 28. of this *Chapter*.

73. Which is all I find remaining of the *Romans* here, but ſome parcels of their *Mony* found at many other places, particularly near *Dorcheſter* not far from *Dike-hills*, near the Fortification at *Idbury*, and *Madmarſton-hill* in the Pariſh of *Swalcliff*, incloſed with a double *vallum*; which I therefore judge to have been *Roman works*. There is alſo a ſmall *circumvallation* in a Wood South and by Weſt of *Harpſden Church*, near which place there has alſo been *Roman mony* dug up (whereof there is ſome in the poſſeſſion of the Worſhipful *Hall Eſq*;) and ſo likewiſe about *Horley*, *Swerford*, *Chippingnorton*, *Teynton*, and a Village called *Sinet* near *Burford*, *Stratton-Audley*, *Fringford* and *Tuſmore*, and moſt of them, of the *Emperors* between *Cocceius Nerva*, and *Theodoſius* the ſecond, excluſively.

74. After the departure of the *Romans* came the *Saxons* into *Britan*, and after them the *Danes*, who alſo made them *Works* ſo indistinguishable from the *Romans* (otherwiſe than by the *Roman mony* found near them, as in the former *Paragraph*) that they can ſcarce be known aſunder: So that whatever of theſe *Fortifications* (at moſt places in this *County* abuſively called *Barrows*) have no *Roman mony* found at or near them, I think we muſt conclude either *Saxon* or *Daniſh*; *Saxon* if ſquare, and if round *Daniſh*; for ſo I find them diſtinguiſh'd in a *MS. History of Ireland* by *E. S.* whereof the firſt ſort he calls *Falkmotés*, i. e. places for the meeting of the *folk* or people, upon the approach of the *enemy*; and the latter *Danerathes*, i. e. *hills* of the *Danes* made for the ſame purpoſe*, though I very much queſtion whether I ſhall find theſe forms ſtrictly obſerved in all places hereafter.

75. Yet I find *Tadmerton-Caſtle*, and *Hooknorton Barrow* not far from it, agreeable to this rule; the former being large and round, and the other ſmaller and rather a *quinquangle* than a ſquare; both of them caſt up (the great round one by the *Danes*, and the leſs ſquare one by the *Saxons*) about the year 914, when the *Danes* in the time of *Edward Senior* being grown ſtrong and numerous, came forth of *Northampton* and *Leiceſter*, and made great ſlaughter of the *Engliſh-Saxons* at *Dochmeretune*, ſays *Job. Brom-*

^w See *Burton's Map* of *Antoninus* his *Itinerary*. * *History of Ireland, MS. penes Authorem.*

ton, An. 10. of Edw. Sen^r. at ~~Hokenertune~~, says *Florentius Wigorniensis*, which he calls *Villam Regiam*², now *Hoke-norton*.

76. As for *Chafleton barrow*, by the above-mention'd rule, it should be a Fortification of the *Danes*, perhaps cast up about the year 1016. at what time *Edmund Ironside* met *Canutus* the *Danish* King hereabout, and defeated him after a long and bloody Battle, fought at a place called *Seorstan* by *Job. Bromton*^a, *Sterneston* and *Scerufdan* by *Matth. Westminster*^b, *Scearstan* by *Florentius Wigorniensis*^c and *Simon of Durham*^d, and *Sejerstan* by *Wormius*, from *sejer victoria*, and *stan lapis*; whereof all the rest seem but corruptions, there being several such in *Denmark* and *Norway* called by that name to this day *: which though they all say expressly was in *Hwinctia* or *Huiccia*, i. e. *Worcester-shire*, yet I verily believe it with *Camden*, to be that *Stone* not far off, called *Fourshire Stone* (or else that other near it) parting four *Counties*, whereof *Worcester-shire* is one.

77. And as for the *Entrenchments* in *Merton Woods*, I guess them cast up by King *Æthelred*, or the *Danes* in the year 871. at what time says *Floren. Wigorniensis*, King *Æthelred* and his Brother *Ælfred*, cum paganis pugnantes apud ~~Meretune~~^e, fighting with the *Danes* at *Mereton* (as I find this town was anciently written in the *Leigier Book of Ensham*^f) overcame them, and put their whole Army to flight. That the *Danes* had somewhat to do hereabout, is further evinced, from one of their spurs in the hands (if I misremember not) of *George Sherman*, of the Town of *Bisseter* not far from this place, which I took no care to get engraven, because already done by *Olaus Wormius*^g, where the Reader may see the exact figure of it: All which put together, and that this place is near the meeting of two military ways, I am pretty well satisfied that this Battle between *Æthelred*, his Brother *Ælfred*, and the *Danes*, was much rather here, than at *Merdon* in *Wilt-shire*, as some have thought it.

78. And if *Adwell Cop* may pass for a *Fortification*, as the *Entrenchments* about it on the South-east-side seem to promise, I guess it made about the year 1010. when the *Danes*, as *Simeon of Durham* testifies, came forth of their Ships in the month of *January*,

¹ In *Chronico Joh. Bromton. Abbot. Jornaletis*, in An. 10. Ed. Sen. ² *Florentius Wigorniensis in Anno* 914. ^a *Chronicon Jo. Bromton Abb. Jorn. in vita Edmundi Fer. lat.* ^b *Matth. Westmon. Flores Histor. in An. 1016.* ^c *Flor. Wigor. in An. citato.* ^d *Simeon Dunelmensis Hist. de gestis Reg. Ang. in eodem.* ^e *Ol. Worm. Mon. Dan. lib. 5. Monumentorum inter Ripensia 5. p. 343.* ^f *Floren. Wigornensis in An. citato.* ^g *E. Registro de Ensham, MS. penes Reverendissimum Decanum & Capitulum Ecclesiæ Cathedral. Christ. Oxoniæ.* ^h *Olai Wormii Monument. Danicor. lib. 1. cap. 7. p. 50. Fig. E.*

and passing through the *Chiltern Woods*, came to *Oxford* and burnt it^h, erecting perhaps this *fortified Barrow* in the way, where 'tis like they might meet with some opposition, and loose some principal *Captain*. As also upon *Shotover-hill*, where there seems to have been two other little *Barrows*, on the left hand of the road from *Oxford* to *London*, that should I confess have been mention'd before in §. 51. of this *Chapter*.

79. But as for the large square *Entrenchments* on *Callow-hills* in the Parish of *Stunsfield* (which yet 'tis possible too may have been an old *British town*, such as described by *Cæsar*, *Oppidum vocant cum sylvas impeditas vallo atque fossâ munierunt*ⁱ, it being much larger than any of the rest, and having deep *holes* within, I suppose, to preserve *water*) the small *Fortification* under *Cornbury Park-wall*, and the large one called *Beaumont*, near *Mixbury-Church*, encompassed with a ditch 170 paces one way, and 128 the other; I can give no account of *them*, but that in general 'tis like they were *works* of the *Saxons*, these being all *square*, though the *last* by its name should indeed be *Norman*.

80. And so again for the *Fortification* commonly called *Round-castle*, west of *Begbrook Church*, but in the Parish of *Bladen*, and *Lineham Barrow* (between which and *Pudlycot*, a Seat of the ancient Family of the *Lacy's*, there is a passage under ground down to the *river*) I can say little of them, but that in general 'tis most probable they were made by the *Danes* (they being both *round*) but upon what particular occasion, I could no where find.

81. Beside the *circles* of *Earth* cast up by the *Danes*, there are others of *stone* in many places of this *Nation*, and particularly one here in the very bounds of *Oxford-shire*, near *Chipping-norton*, in the Parish of *Little Rollwright*, the *stones* being placed in manner and form, and now remain as exactly engraven *Tab. 16. Fig. 2222*, in a *round* of 'twixt 30 and 40 paces over; the tallest of *them* all (which may be a *scale* for the rest) being about seven foot high. North of these, about a Bolts-shoot off, on the other side the hedge, in the County of *Warwick*, stands one singly alone, upwards of nine foot high, in form as described *Fig. 1.* and Eastward five others, as in *Fig. 3.* about two furlongs off,

^h Simeon Dunelmensis, de gestis Reg. Ang. in Anno 1010. ⁱ Julii Cæsaris Commentarior. de bello Gallico, lib. 5.

the highest of *them* all about nine foot also ; meeting formerly at the top (as drawn by Mr. *Camden*) with their tapering ends, almost in shape of a *wedge*, since whose time there are two of them fallen down from the rest. Of which ancient *Monument* (or what ever else it be) he gives us in brief this following account ^k.

82. Not far from *Barford* (he should have said *Chipping-norton*, for *Barford* cannot be less than 7 or 8 miles from it) upon the very border of *Oxford-shire*, is an ancient *Monument*, to wit, certain huge stones placed in a *circle*: the common people call them *Rollrich-stones*, and dream they were somtimes *men*, by a miraculous *Metamorphosis* turned into hard stones. The highest of them all, which without the *circle* looketh into the *Earth*, they call the *King*, because he should have been *King of England* (forsooth) if he had once seen *Long-Compton*, a little Town lying beneath, and which one may see if he go some few paces forward.

83. Other *five* standing on the other side, touching as it were one another, they imagin to have been *Knights* mounted on *horse-back*, and the rest the *Army*. These would I verily think, says he, to have been the *Monument* of some *Victory*, and happily erected by *Rollo the Dane*, who afterward conquer'd *Normandy*; for what time he with his *Danes* troubled *England* with *depredations*, we read that the *Danes* joyned Battle with the *Englisch* at *Hoch-norton*, a place for no one thing more famous in old time, than for the woful slaughter of the *Englisch* in that foughten Field under the Raig of King *Edward the elder*.

84. That this *Monument* might be erected by *Rollo the Dane*, or rather *Norwegian*, perhaps may be true, but by no means about the time of *Edward the elder*; for though it be true enough that he troubled *England* with *depredations*, yet that he made them in the days of King *Alfred*, I think all the ancient *Historians* agree, *An. 897.* according to *Florilegus* ^l, but according to Abbot *Bromton* ^m a much better *Author*, in the year 875, near 40 years before that slaughter of the *Englisch* in King *Edwards* days, as will plainly appear, upon comparison of *this* with the 75. §. of the same *Chapter*.

85. Therefore much rather than so, should I think he erected *them*, upon a second Expedition he made into *England*, when he

^k *Britannia* in *Oxfordsh.* ^l *Matth. Westmonast. in An. citato.* ^m *Johan. Bromton Abb. Jorn. in vita Auredi.*

was called in by King *Æthelstan* to assist him (as *Thomas of Walsingham* witnesses) against some potent *rebels* that had taken arms against himⁿ; whom having vanquished, and reduced into obedience to their *Prince*, and perhaps too slain the designed *King* of them (who possibly might be persuaded to this *rebellion*, upon a *conditional Prophecie* of coming to that *honor* when he should see *Long-Compton*) might erect this *Monument* in memory of the *Fact*; the great *single Stone* for the intended *King*, the *five Stones* by themselves for his *principal Captains*, and the *round* for the *mixt multitude* slain in the *Battle*, which is somewhat agreeable to the *tradition* concerning them.

86. But if I may give my opinion what I really think of them, (though I do not doubt much but they must be a *Danish* or *Norwegian monument*) I can by no means allow the *round* or *other Stones* to be *Sepulchral monuments*: For had the *Cirque* of *stones* been any such *memorial*, it would certainly have had either a *tumulus* in the middle, like the *monument* near the way to *Birck* in *Seland*, and of *Langbeen Kiser* not far from it^o, and another near *Roeschild*^{*}; or a *stone Altar*, as in the notable *monument* of *Harald Hyldetand* near *Leire* in *Seland*^p, placed there, says *Wormius* (in another part of his Book) *eo fine ut ibidem in memoriam defuncti quotannis sacra parantur*, that they might yearly offer *Sacrifices* in memory of the *defunct*, at the place of his *inhumation*. But neither of these are within *Rollright Cirque*, nor could that curious and learned *Antiquary* the *Worshipful Ralph Sheldon* of *Beoly Esq*; (one of the noblest *Promoters* of this *design*) who industriously dug in the middle of it (to see whether he could meet any *symbols* or *marks*, either who might erect it, or for what end or purpose) find any such matter.

87. For the very same reason, it is also as certain that it cannot have been any place of *Judicature*, such as was used in old time in the *Northern Nations*, whereof there is one so great in *Seland*, as described by *Wormius*, that it takes up no less than six and forty great *stones* of stupendious magnitude within its circumference^q, and so does *Rollright* and more too; but then it has no *stone* (nor I suppose ever had) erected in the *middle* for the *Judge* to sit on, as those always had. Beside these *Fora*, or

ⁿ Tho. de Walsingham *Ypodigma Neustrie*, sub initium. ^o Olai Wormii *Mon. Danic. lib. 1. cap. 3.* ^{*} *Idem lib. 1. cap. 6.* ^p *Idem lib. 1. cap. 5.* ^q Olai Wormii *Mon. Danic. lib. 1. cap. 10.*

places of *Judicature*, (by the *Danes* called *Tings*) seem always to have had their *muniments* of *stone*, either of a *Quadrangular* or *Oval* Figure, and not to be entered but at two sides, as that at *Ortingham* mention'd by *Wormius*^r, whereas ours is *circular*, and shews no signs of such *gates*.

88. Which perhaps might occasion the Learned Dr. *Charleton*, to judg it rather a *Trophie*, or *Triumphal pile*, set up as a *Monument* of some great *Victorie*^r, to whom though I cannot but somewhat incline, yet am verily perswaded, that at the same time it might serve also for the *Election* and *Inauguration* of a *King*; and much rather than the great and famous *monument* of *Stone-Heng* on *Salisbury Plain*; the very disparities betwixt it and those in *Denmark*, brought by himself^r, being not to be found here.

89. For beside that it is placed (as all such *Courts* of the *Danes* were) 1. Upon a rising ground, for the advantage of *prospect* (that the common people assembled to confirm the suffrages or votes of the *Electors* by their universal applause, and congratulatory acclamations, might see and witness the solemn manner of *Election*;) 2. Made of huge *stones* of no regular Figure. And thirdly, Having no *Epigraph* or *Inscription* cut or trenched in the *stones*, as carrying a sufficient evidence of its designment and use, in the figure of its *platform*. It is but a *single Cirque* of *stones* without *Epistyles* or *Architraves*, few of them very high on which the *Electors* might easily get up to give their *suffrages*, as was usually done in the *Northern Nations*; whereas *Stone-Heng* is made up of *three circles* at least (some say *four*) and the *stones* of each *circle* joyned with *Architraves*, whereof there is no *example* to be found in those *Countrys*.

90. Now that the *Northern Nations* usually erected such *Cirques* of rude *stones* for the *election* of their *Kings*, is fully testified by *Olaus Wormius*, *Reperiuntur inquit in his oris loca quædam in quibus Reges olim solenni creabantur pompâ, quæ cincta adhuc grandibus saxis, ut plurimum duodecim, conspiciuntur, in medio grandiore quodam prominente, cui omnium suffragiis Electum Regem imponebant, magnoque applausu excipiebant. Hic & Comitia celebrabant, & de Regni negotiis consultabant. Regem vero designaturi Electores Saxæ insistebant forum cingentibus, decreti firmitudinem pronunciantes*^u, i. e. as Englished by Dr. *Charleton*^w.

^r Ibidem. * Doctor *Charleton's* *Stone-Heng* restored to the *Danes*, pag. 46. † Idem pag. 54. ^u Of *Wormii Monument*, *Danic. lib. 1. cap. 12.* ^w *Stone-Heng* restored to the *Danes*, pag. 48.

91. In this County are beheld certain *Courts of Parliament*, in which *Kings* heretofore were solemnly elected, which are surrounded with great *stones*, for the most part twelve in number, and one other *stone* exceeding the rest in eminency, set in the middle; upon which (as upon a *Regal Throne*) they seated the new elected *King*, by the general suffrage of the Assembly, and inaugurated *him* with great applause and loud acclamations. Here they held their great *Councils*, and consulted about affairs of the *Kingdom*: But when they met together to nominate their *Kings*, the *Electors* stood upright on the *stones* environing the *Court*, and giving their *voices*, thereby confirmed their choice.

92. The very same practice of the *Northern Nations*, with the Ceremonies of it, are also briefly set down by *Saxo Grammaticus*, *Lecturi Regem veteres affixis humo Saxi insistere suffragiaque promere consueverunt, subjectorum lapidum firmitate, facti constantiam ominaturi*^x, i. e. that the *Ancients* being about to choose their *King*, used to stand upon *stones* fixed in the ground, and thence give their *votes*, by the firmness of the *stones* on which they stood, tacitly declaring the *firmness* of their *Act*. Which manner of *election* is also proved of them, by *Cranzsius*, *Meursius*, and *Bernhardus Malincort de Archicancellariis*^y.

93. Which places of *election* it seems were held so *sacred*, as further testified by *Wormius*^z, and out of *him* by *Dr. Charleton*^a, that in times of *peace* the *Candidate King*, was obliged *de Jure* there to receive his *Inauguration*, the place and *ceremonies* being accounted essential parts of his *right to Sovereignty*, and the *votes* of his *Electors* much more valid and authentick for being pronounced in the usual *Forum*.

94. But if it happened the *King* fell in a *Foreign expedition* by the hand of the *enemy*, the *Army* presently got together a parcel of great *stones*, and set them in such a *round*, as well sometimes perhaps for the interment of the *corps* of the deceased *King*, as *election* of his *successor*. And this, 'tis like, they did, 1. Because they esteemed an *election* in such a *Forum*, a good addition of *Title*. And second, with all expedition, because by the delay of such *election* too long, irreparable damages many times accrewed to the *Republick* thereupon^b; which practice of the *Danes* they

^x *Saxon. Grammatici Hist. Danorum*, lib. 1. sub initium. ^y De quibus vide *Olaus Wormium*, *Mon. Dan.* lib. 1. cap. 12. ^z *Ibidem* sub finem. ^a *Stone-Heng* restored to the *Danes*, p. 48. ^b *Ol. Wormii Mon. Dan.* lib. 1. cap. 12. sub finem.

both confirm, by the *authorities* of *Stephanus Stephanus*, in his *Commentaries* on the first Book of *Saxo Grammaticus*'s History of *Denmark*, and *Svaningius* a grave and faithful *Writer* of that Nation, though what they cite of the latter (if that be all *he* says) scarce proves quite so much.

95. Beside the erection of *Stones* in Foreign Nations upon the loss of one *King*, and *election* of another, what if I should add that its also very likely that the same might be done at the *Investiture* of a *Conqueror* into a new acquired *Principality*: Thus why might not *Rollo*, either being compelled as a younger brother, to leave *Denmark* or *Norway*, as was appointed by the *Law* of the former *Kingdom*, and to seek him a new seat^c; or forced from the latter for *Piracy* by King *Harold Harfager*, as in the *Chronicle* of *Norway*^d; I say, why might not *Rollo* after good success against those he invaded (as *Walsingham* says expressly he was^e, though in another place) be elected *King* by his followers, and be *inaugurated* here, as well as there, within such a circle of stones, which bearing his name to this very day, and he being acknowledged both by *Bromton*^f and *Florilegus*^g to have beaten the Saxons, and to have tarried in this Nation a whole Winter, it is highly probable he might be.

96. For if we enquire into the origin of the name of this *Cirque* of stones, we shall find that *Reich* or *Ritt* signifies a *Kingdom*, and sometimes a *King*, as *Eyn reich frau*, the *Queen*, or *Kings woman*^h: Whence 'tis plain, that these stones seem still to be called the stones of *King Rollo*, or perhaps rather of *Rollo's Kingdom*, for it was customary for them to have so many *Cirques* of stones as *Kingdoms*, though in the same Country. Thus, as *Wormius* testifies, there are three at this day in the *Kingdom* of *Denmark*; one in *Seland*, another in *Schoneland*, and a third in the *Cimbrick Territory*, because these were anciently three distinct *Principalties*, and under the dominion of as many *Kings*ⁱ, as 'tis certain *England* was also about this time.

97. And if this conjecture may be allowed to take place, we are supplied also with a reason why we have no *tumulus* in or near this monument, there being no *King* or eminent *Commander* slain, but only a conquest of the enemy in or near this place, intimated

^a *Tbo Walsingham's Ypodigma Neustrie in principio.* ^d *Vid. Chronicon. Norwegicum.* ^e *Tbo. Walsingham's Ypodigma Neustrie in principio.* ^f *Job. Bromton Abbat. Jornal. in An. 875.* ^g *Matth. Westmon. in An. 897.*

^h *Vid. Petri Dasypodii Dictionar. Lat. German. in verb. Regno.* ⁱ *Ol. Wormii Mon. Dan. lib. 1. cap. 12.*

by the *five stones* meeting in a point at the top ; which perhaps may be the disposition intended by Saxo Grammaticus, and out of him by Wormius, *Cuneato ordine*, which he says expressly signified, *Equestrium acies ibidem, vel prope, fortunatius triumphasse* ^k i.e. that Knights or Horse-men there, or near the place, obtained a glorious Victory.

98. Yet against this conjecture I fore-see there lye two *objections* worth removal. 1. That in these *Cirques* of *stones* designed for the *election* of *Kings*, there was always a *Kongstolen* most times bigger than the rest placed in the middle of it, as intimated above, §. 96. And secondly, that had this place been at first designed for the Inauguration of a *Danish* or *Norwegian* King, and such places been so essential to a good *title*, as pretended above, §. 93. certainly all the *Kings* of the *Danish* race that reigned after here in *England*, would have been either crowned here, or at some other such *Forum* ; whereas we have no such *Kongstolen* in the middle of the *Cirque* ; and beside, find *Canutus* with great solemnity Crowned at *London*, *Harold Harefoot* here at *Oxford* (not far from this *Cirque*) and *Hardi-Canute* likewise at *London*.

99. To which it may be replied, that though not placed in the *Cirque*, yet here is a *Kongstolen* not far off, which 'tis like was not necessary should be set within it ; for I find the *place* where the new *elected* King stood and shewed *himself* to the people, at the *Forum* for this purpose at *Leire* in *Seland*, to have been without the *Area*, as our *Kongstolen* is. *Area saxis undique cincta Coronationi Regum deputata vicinum habet Collem, cui Coronatus jam insistebat jura populo daturus, & omnibus conspiciendum se præbiturus* ^l, i. e. that the *Area* encompassed with *stones* designed for the Coronation of their *Kings*, had a *Hill* near it, whence the new Crowned King gave *Laws*, and shewed *himself* to the *people* ; it seeming indifferent from hence, and another such like *hillock* called *Trollebarothoy*, whereon the King also stood, at the place of such *election* near *Lundie* in *Scania* ^m, whether he ascended a *stone* or *mount* of *earth* ; within, or without the *Area*, so he thence might be seen and heard by the *people*.

100. And to the second *Objection* it may be reasonably answered, that the *Danes* by this time having gotten the whole Kingdom, and such capital Cities as *London* and *Oxford* were,

^k Idem lib. 1. cap. 9. ^l Idem lib. 1. cap. 5. ^m Idem lib. 1. cap. 12.

might well change the places of their *Coronations* : Beside, *Canutus* and the rest were much greater persons, and more civilized than *Rollo* and his crew, can be presumed to have been ; for beside that he lived above a hundred years before them, we find him (though the son of a *Norwegian* *King*, or *Earl*) a great *Pirate* at Sea ⁿ, and little better than a *Robber* by Land ; well might he therefore be contented with this *Inauguration*, after the old barbarous fashion, having gained no *City* wherein it might be done with greater solemnity.

101. But as for the *stones* near the *Barrow* at *Stanton-Harcourt*, called the *Devils Coits*, I should take them to be *appendices* to that *Sepulchral Monument*, but that they seem a little too far removed from it ; perhaps therefore the *Barrow* might be cast up for some *Saxon*, and the *stones* for some *Britans* slain hereabout (aut *vice versa*) at what time the Town of *Egnesham*, about a mile off, as *Camden* informs us, was taken from the *Britans* by *Cuthwulf* the *Saxon* ^o. Which is all I can find worthy notice concerning them, but that they are about eight foot high, and near the base seven broad ; and that they seem not *natural*, but made by art, of a small kind of *stones* cemented together, whereof there are great numbers in the Fields hereabout ; which makes thus much for the conjecture concerning those at *Stone-Heng*, that they may be *artificial*, it being plain from these, that they could, and did do such things in the ancients times.

102. There stands also a stone about half a mile South-west of *Enston* Church, on a Bank by the way-side between *Neat-Enston* and *Fulwell*, somewhat flat, and tapering upward from a broad bottom, with other small ones lying by it ; and another near the road betwixt *Burford* and *Chipping-norton*, which I guess might be erected for the same purpose with the two former, as above-mention'd : Unless we shall rather think, both *these* and *them* to have been some of the *Gods* of the ancient *Britans*, as the Reverend and Learned Dr. *Stillingfleet* thinks it not improbable those *Pyramidal stones*, mention'd by *Camden* in *York-shire*, called the *Devils bolts* ^p, sometimes were. And so likewise *Stone-Heng* in *Wiltshire*, which he judges neither to be a *Roman Temple*, nor *Danish Monument*, but rather somewhat belonging to the *Idol Marko-*

ⁿ Vid. *Chronicon. Norwegicum.* ^o Vid. *Camd. Britan. in Oxfordsh.* ^p Idem in *Com. Ebor.*

lis, which *Buxtorf* saith the *Rabbins* called בית קוליס *domum Kolis*^a; of which more hereafter when I come into that *County*; and into *Kent*, where of *Kits-coty-house*, which I take to be an *Antiquity* of the same kind.

103. That the *Britans* long before the arrival of the *Romans*, were acquainted with the *Greeks*, has sufficiently I guess been made appear already, §. 66. of this *Chapter*; and that long before that they were known to the *Phanicians*, and all the *Eastern Countries*, is plain out of *Strabo*^r, and *Bochartus*^s, and by comparison of the *Learning* and *Religion* of the *Druids*, with those of the *Indian Brachmans*. Now that it was the ancient custom of all the *Greeks* to set up unpolisht stones instead of *Images*, to the honor of their *Gods*, we have the testimony of *Pausanias* in these words, πᾶς ὃ ἐν παλαιότητι, ἐ τοῖς πᾶσιν Ἑλλεσι, πρὶς θεῶν ἀντὶ ἀγαλμῶν εἶχον ἄργοι λίθοι. i. e. that unheewn stones amongst all the *Græcians*, had the honor of *Gods* instead of *Images*; more particularly the same *Author* asserts, that near the *Statue* of *Mercury* there were 30 square stones, τετράγωνοι λίθοι τεύχοντα, which the *Pharii* worshipt, and gave to every one of them the name of a *God*^u.

104. That the *Arabians* and *Paphians* also worship'd such like *Gods*, is likewise witnessed by *Maximus Tyrius*. Ἀράβοι σίβουσι μὲν, ὄντινα δὲ σὺν οἷδα. ὃ δὲ ἀγαλμα ὃ εἶδον, λίθος ὡς τετράγωνος. Παφίοισι ἡ μὲν Ἀφροδίτη πᾶς πρὶς ἔχει, ὃ δὲ ἀγαλμα ἐκ ἀνείχεσθαις ἄλλω πρὶς ἢ πυραμίδι λευκῇ. i. e. that the *Arabians* worship'd he scarce knew what *God*, but that he saw amongst them was only a square stone; and that the *Paphians* worship'd *Venus* under the representation of a white *Pyramid*.

105. And *Herodian* describing the *Worship* of *Helagabalus* at *Emesa* in *Phænicia*, saith, that he had no kind of *Image* after the modern *Greek* or *Roman* fashion made by mens hands, λίθος δὲ πρὶς ἐστὶ μέγας, καὶ πωρὲν περὶ σφαιρῆς, λήγων εἰς ὀξύτεϊα, κανοειδὲς αὐτῷ σχῆμα. i. e. but a great stone round at the bottom, and lessening by degrees toward the top, after the manner of a *Cone*. To which add, that *Peter della Valle*, in his late *Travels* into the *Indies*, saith, that at *Ahmedabad* there was a famous *Temple* of *Mahadeu*, wherein there was no other *Image* but a little column of stone af-

^a Job. Buxtorfii Lex. Talmud. in v. Markolis. ^r Strabonis Geographiæ, lib. 3. pag. 175. Edit. J. Casaub. Paris, An. 1620. ^s Sam. Bocharti Geog. Sacra. part. 2. lib. 1. cap. 39. ^t Πρωτογενὲς Λέγων. pag. 228. Edit. Sylburg. ^u Ibidem. ^v Max. Tyrii Dissert. Philosoph. 38. p. 384. Edit. Dan. Heinsii. ^x Herodiani Historiar. lib. 5. pag. 114. Edit. Hen. Stephani.

ter a *Pyramidal* form; which *Mabadeu*, he saith, in their Language signifies the great *God*^y. And after this fashion, he saith, 'tis the custom of the *Brachmans* to represent *Mabadeu*^z.

106. All which being put together, especially as recommended by so Learned a Person as the Reverend Dr. *Stillingfleet*, have prevailed with me much: However, the *Reader* is free to use his judgment, whether they are *memorials* of the *dead*, as commonly thought, or representations of the *Deities* of the ancient *Britans*, given them by some Companions of the Eastern *Merchants*, trading hither for *Tin*, to the *Cassiterides*.

107. Other *Antiquities* contemporary with the *stones* above-mentioned, I met with none here in *Oxford-shire*, but those three *Rings* lincked one within another, and engraven by mistake a little out of their place, *Tab. 16. Fig. 4.* for that they are not like to be *British* or *Roman*, I think is pretty certain. The *Britans*, 'tis true, used *Rings* instead of *Money*, yet as *Cæsar* testifies, they were only of *Iron*^a. And though the *Romans*, amongst their other *dona militaria*, did usually give *Calceos*^b, *five armillas*, *bracelets*, yet they were constantly I find, either of *gold* or *silver*; whereas *ours*, as in number, are of three different materials; the largest *copper*, the second *iron*, and the least *green glass*, or some *stone* of that colour.

108. It remains they must therefore be either *Saxon* or *Danish*, but whether of the two, we must not hope to determin, since we find such *rings* used by both *Nations*. That the *Saxons* had such *bracelets*, is plain from King *Ælfred*, who notwithstanding he came to the Kingdom, long habituated as it were to *rapines* and *murders*, yet brought it before his death into so good a posture, (as is learnedly made out, and by what degrees he did it, in that excellent *History* of his *Life*, now in the *Press*) that he could, and did hang up such *bracelets* of *gold* in the high-ways, which no *Traveller* dared touch. *Ælfredus per publicos aggeres, ubi semitæ finduntur in quadrum, Armillas jubebat aureas appendi, ut Viantium aviditatem irritaret, cur non esset qui eas acciperet*, says *Florilegus* of him^c. Where, by the way, perhaps it may not be amiss to note, that these *Rings* were drawn out of the River *Cherwel* with a *Fishing-net*, near *Hampton Gay*, not far from the meeting of

^y *Pet. della Valle Viaggi*, p. 3. *Lett. 1. §. 15. p. 107.* ^z *Ibidem.* ^a *Jul. Cæsaris Comment. de bello Gallico, lib. 5.* ^b *Vid. Sexti Pomp. Festi, Fragment. libro 3.* ^c *Matth. Westmon. Flores Hist. in An. 892.*

such ways at *Kirklington*, and kindly bestowed on me by my worthy Friend Mr. *Barry*, amongst some other matters of like nature, though not so fit to be mention'd here.

109. And that the *Danes* also made the same *Experiment* of the innocency of their people, and of universal peace & freedom from rapine, is as manifest out of *Saxo Grammaticus*, who says expressly of *Frotho the Great*, *Ut uniuscujusque rem familiarem à furum incursum tutam præstaret, Armillam unam in Rupe, &c.* ^d i. e. that he might preserve every mans Goods from the spoils of thieves and robbers, hung up a bracelet of gold on the rock called after his own name, *Frothonis petram*; and another in the Province of *Wig*, threatening great severity to the *Presidents* of those Countries, if they should be taken away. They used them also (like the *Romans*) as rewards of valour, as appears from the proffer of King *Roricus*, of his six bracelets to any man that would undertake the *Champion* of the *Sclavi* (his Enemies) challenging any man in his Army^e; and sometimes too as rewards of Wit, as the same *Author* informs us, *Wiggo* being honor'd with a great *Armilla* by *Rolvo Krage*, for a Jest^f; and *Refo*, by *Goto King* of *Norway*, *ideo tantum quod eum cultius & familiarius habuisset* ^g.

110. These *Armilla*, the *Danes* and other Northern Nations accounted so sacred, that as *Bartholin* informs us out of *Arngrimus*, the *Islanders* usually swore upon them, *Cujus religionis fuit ritus, ut juramentum præstituri, adhibitis testibus Annulum in Ara Deorum asservari solitum, & in foro Judiciali à Judice supremo in brachio gestatum, hostiarumque sanguine illinitum, attrectarent* ^h, i. e. that the manner of people to be sworn was, that before witness they should lay their hands on a certain Ring, usually kept upon the altar of their gods, worn upon the arm of the Chief Justice (whence 'tis plain it was an *Armilla*) and smeared over with the blood of their Sacrifices. And *Ethelwerdus* and *Asserius* both acquaint us, that King *Ælfred* having gotten considerable advantage over the *Danes*, made them swear (beside on his own Reliques) *in eorum Armilla sacra, quod cæterarum Regionum Regibus fecere nunquam* ⁱ, i. e. upon their holy bracelet, which they had never done before to the Kings of any other Nation.

^d *Saxon. Gram. Hist. Dan. lib. 5. p. 46. Edit. Operin.* ^e *Idem lib. 3. pag. 24. D.* ^f *Idem lib. 2. pag. 16 C.* ^g *Idem lib. 8. pag. 83. C.* ^h *Tho. Bartholini Schedion de Armillis veterum, §. 7. p. 98.* ⁱ *Chronicorum Ethelwerdi, lib. 4. in An. 876. vid. etiam Asserium Menevensi. in eodem An.*

111. Which *Armilla* it seems were sometimes single, and sometimes curiously link'd together. Thus the *six bracelets* of King *Roricus* above-mentioned, are said to have been, *ita mutuis nexibus involutas ut ab invicem sequestrari nequirent, nodorum inextricabiliter serie coherente*^k, i. e. so inextricably involved one within another, that there was no parting them. The Learned *Bartholin* also informs us, that sometimes the *Armilla* had a *Ring* hung to it. *Est tamen Armilla suus quandoque circulus*^l: And that when rings are thus hung to bracelets, there is always some mystery in it, *quod annuli Armillis fere jungantur non caret mysterio*^m. Where by *Armilla* he means *Ψμια*, or *Σειρρμα*, ornaments for the wrists, and by *annuli* and *circuli*, ornaments for the fingers: *Armilla id brachio præstant, quod digitis annuli*ⁿ, i. e. that bracelets have the same use on the wrist, that rings have on the finger.

112. Now that ours was an *Armilla*, is plain enough, for that the great *Copper* ring is of somewhat above three inches diameter, and big enough to encompass any ordinary mans wrist; the lesser *iron* one, and *green ring* of glass, being additional ornaments, especially the latter, which questionless was put on to represent an *Emrauld*; that sort of stone, as *Pignorius* and *Bartholin* both testify, being much used in bracelets^o: which makes me think it the bracelet but of some ordinary person, the *Armilla* it self being copper, with which, saith *Bartholin*, only the vulgar adorned themselves, *Armilla ærea, plebeæ censendæ sunt*^p, and the appendent glass but a counterfeit jewel.

113. For eminent places in this County, during the Government of the Saxons and Danes in Britan, we may reckon first *Banbury*, then called *Banerbyrig*, where *Kenric*, the second *West-Saxon* King, about the year 540, put to flight the *Britans*, fighting for their lives, estates, and all they had^q. After the Conquest, about the year 1125. it was strengthened with a Castle by *Alexander* the then great Bishop of *Lincoln*; and since that, Jan. 26. 1^o *Mariæ*, made a *Burg* or *Burrough* consisting of a *Bayliff*, 12 *Aldermen*, and 12 *Burgesses*, in recompence of their faithful service done to the said Queen *Mary* (as 'tis exprest in their *Charter*) in manfully resisting *John* Duke of *Northumberland* that rebelled against her; whence 'tis plain this Town was ever zealous in matters of

^k Sax. Gram. Hist. Dan. lib. 3. p. 24. D. Edit. Operini. ^l Tho. Bartholin. Schedion de Arm. Vet. §. 4. p. 41. ^m Idem §. 4. in princip. ⁿ Ibidem. ^o Vid. Laurentium Pignorium de Servis. Et Bartholin. Schedion de Arm. mill. §. 3. p. 37. ^p Idem §. 3. de Armillarum materia, p. 32. ^q Camd. Britan. in Oxf.

Religion, of what persuasion soever they were, heretofore as well as now. Since again on the 8 of *June*, *Jac.* 6, it was made a *Major Town*, consisting of a *Major*, 12 *Aldermen*, and 6 *Capital Burgeses*.

114. And secondly, *Benson*, alias *Benefingtune**, which *Marian* (says *Camden*) calls *villam Regiam*, the *Kings Town*, and reporteth that *Ceaulin*, the third King of the *West-Saxons*, about the year 572, took it from the *Britans*, which his successors kept 200 years after, till they were dispossessed again by *Offa* the great King of the *Mercians*†. And thirdly, though *Dorchester* has its name from the *British Dour*, which signifies *water*, and therefore called by *Leland*, *Hydrópolis*; and seems to have been known to the *Romans* by the *mony* found thereabout, and the *Latin* termination *Cester*, which, says *Leland*, the *Saxons* applyed to *Cities* as well as *Fortifications*‡; yet it never came to its height till *Birinus*, *an.* 614. was seated there as Bishop of the *West-Saxons*, by *Cynigelse* their King, whom he had newly Baptized, and *Oswald* King of *Northumberland*, God-father to *Cynigelse*§.

115. About this time the Town of *Berencester*, alias *Berncester*, in *Saxon* *Bupenceaster*, and *Bennacester*, which I take to have been its *primitive* names, seems also to have been raised, and to have taken its name, as some have thought, from the same Bishop *Birinus*, *quasi Birini castrum*: But I much rather believe it so called from *Bern-wood*, or *Forrest*, mention'd by *Bede*¶, *Florilegus*, and *Wigorniensis*⁹, upon the edge whereof it was then seated, nor is now far off it; after which perhaps from *St. Eadburg*, to whom the *Priory* there was, and *Parish Church* is now dedicated, it changed its name to *Burgcester*, and since that to *Burcester*, now *Bisseter*.

116. The Town of *Burford*, in *Saxon* *Beorforð*, seems also to have been a place of good *Antiquity*, but most remarkable for a *battle* fought near it, about the year 750*, perhaps on the place still called *Battle-edge*, West of the Town betwixt it and *Upton*; between *Cuthred* or *Cuthbert*, a tributary King of the *West-Saxons*, and *Ethelbald* the *Mercian*, whose insupportable exactions the former King not being able to endure, he came into the Field against

* *Will. Malmesburiens. de gestis Reg. Ang. lib. 1. cap. 2.* † *Camdeni Britan. in Com. Oxon.* ‡ *Lelandi Comment. in Cygneam Cant. in v. Hydrópolis.* § *Ven. Bedæ Hist. Ecclesiæ Gent. Ang. lib. 2. cap. 7.* ¶ *Chronologia Saxonica, in An. 921.* ⁹ *Mat. Westmon. & Florent. Wigorn. in An. 918.* ⁂ *Rog. Hoveden Annual. Part. priori in An. citat.*

him, met, and overthrew him here about *Burford*, winning his *Banner* wherein there was depicted a *golden Dragon*^y; in memory of which *Victory*, perhaps the *custom* (yet within memory) of making a *Dragon* yearly, and carrying it up and down the *Town* in great *jollity* on *Midsummer Eve*, to which (I know not for what reason) they added a *Gyant*, might likely enough be first instituted.

117. After the *Conquest*, I find it the *Town* of *Robert Earl of Gloucester*, base Son to King *Henry the First*, to whose Son *William* I have seen an *Original Charter* granted him by King *Henr. 2.* giving to this his *Town* of *Bureford*, *Gildam & omnes consuetudines quas habent liberi Burgenses de Oxeneford*; most of which it has since lost, and chiefly by the over-ruling power of *Sir Lawrence Tanfield*, Lord chief Baron in Queen *Elizabeth's* time: Yet it still retains the face of a *Corporation*, having a *common Seal*, &c. the very same with *Henley*, as described in the *Map*, if they differ not in colours, which I could not learn.

118. As for *Wudustoke*, or *Wudestoc*, *Sax. pubertoc (i. e. locus sylvestris)* now *Woodstock*, it seems to have been a *seat Royal* ever since the days of King *Ælfred*, it appearing by a *MS.* in *Sir John Cotton's Library*, that he translated *Boetius de Consolatione Philosophiæ*, there². Nay, so considerable was it in the time of King *Ætheldred*, that he called a *Parliament* there, and Enacted *Laws*, to be seen amongst that *collection* of ancient *Laws* set forth by *Mr. Lambard*³. Whence it may almost be certainly concluded, that here must have been a *house* of the *Kings of England*, long before the days of King *Henry the First*; who yet 'tis like indeed was the first that inclosed the *Park* with a *wall*, though not for *Deer*, but all foreign *wild Beasts*, such as *Lyons*, *Leopards*, *Camels*, *Linx's*, which he procured abroad of other *Princes*; amongst which more particularly, says *William of Malmesbury*, he kept a *Porcupine*, *hispidis setis coopertam, quas in Canes insectantes naturaliter emittunt*^b, i.e. cover'd over with sharp pointed *Quills*, which they naturally shoot at the *dogs* that hunt them.

119. Of the *Town* of *Thame*, anciently *Tameſſopſa*, I could find little, till about the time of *Edward Senior*, An. 921, when the *Daniſh Army* out of *Huntingdon* came hither and erected some

¹ *Camd. Britan. in Com. Oxon.* ² *MS. in Biblioth. Cottoniana, sub Othone A.* ³ *Αρχαιολογικ. Gul. Lambard, fol. 82.* ^b *Will. Malmesburiens. de Henr. 1. lib. 5.*

kind of *Fortification*; but at this time it seems it was so considerable, that it had the reputation of a *Burg*; for King *Edward* coming against it the same year, his *Army* is said to have besieged the *Burg* and taken it, and to have slain the *Danish* King, Earl *Toglor*, and Earl *Manann* his son, his brother, and all others whatever within the *Town*^c. And again, *An.* 1010. when the *Danes* over-ran most of this part of *England*, we find this *Town* amongst others to have suffered much by them^d.

120. *Chippingnorton*, anciently *Ceapan-neptune*, was also most certainly a *Town* of note in the *Saxons* days, as one may gather from its name, it being so called from *Ceapan Emere*, to buy or cheapen, so that it implies as much as *Mercat Norton*, or *Norton* where the people usually cheapened Wares. And *Whitney*, now *Witney*, seems to have been a *Town* of good repute before the *Conquest*, it being given about the year 1040. to the Church of *St. Swithins Winton*: with eight other *Manors*, by *Alwinus* then Bishop of that *See*, who for his over-familiarity with *Emma* Mother to *K. Edward the Confessor*, was causelessly suspected of *Adultery* with her: Of which suspicion Queen *Emma* purging herself and him by the *Fire Ordeal*, of walking bare-foot over nine red-hot plough-shares without hurt; in thankfulness ('tis said) they each gave nine *Manors* to the Church of *Winchester*, which are all named by Mr. *Dugdale*, *Witney* being one of those given by *Alwinus*^e.

121. And the neighboring *Town* of *Bampton*, anciently *Bemtune*, seems to be of much about the same antiquity, yet neither can I find any higher *Record* of it, than of *Leofric* Chaplain to King *Edward the Confessor*, who *An.* 1046. upon the union of the Bishopricks of *Criditon* and *Cornwal*, and both of them translated to *Exeter*, whereof he was made the first *Bishop*, quickly after gave to this his new Church his lands at *Bemtune*^f, to which it belongs to this very day.

122. Which is all I could meet with of the *Towns* of *Oxfordshire* before the *Conquest* (for after long search I could find nothing of *Deddington*, till about the Reign of King *Edw.* 2. whereof when I come to speak of the *Castle* there) concerning which I could have added much more, and brought their *History* down

^c *Chronologia Saxonica*, in *An.* 921. ^d *Job. Bromton Abb. Journal*, in *An.* citat. ^e *Monastici Anglicani*, vol. 1. inter *Addenda*, pag. 980. ^f *E. Cod. vet. MS.* in *Bib. Bod. fol. Med.* 120. in princip.

to these times, as above in *Banbury*; only *that*, and whatever else is worthy notice of them, may be found in some other *modern Histories*.

123. Yet before we come to the *times* since the *Conquest*, let us first remember that the Town of *Islip*, Sax. Gightſlepe, Or Gibrſlepe; must needs be of good repute in those days, for *Camden* says expressly, and so do several other *Authors*, that King *Edward* the *Confessor* was born there, which they prove from his original *Charter* of *Restoration* of the *Abby* of *Westminster*, wherein he gives to this his new *Church* the Town of *Islip*, with the additional Clause of [*the place where he was born*^s] which though, 'tis true, I could not find in Mr. *Dugdale*^h, yet here remaining some foot-steps of the ancient *Palace*, and a *Chappel* now put to profane use, called the *Kings Chapel*, and the *Town* still belonging to the *Church* of *Westminster*, there is no great doubt to be made of the thing, *tradition* it self being not like to be erroneous in a matter of this nature, though there were no such *Charter* to prove the thing alleged, which yet we have reason to believe there is, or was, though not produced by Mr. *Dugdale*.

124. In the *Chapel* above-mentioned, not many years since, there stood (as was constantly deliver'd down to posterity) the very *Font*, wherein that Religious Prince, St. *Edward* the *Confessor*, received the *Sacrament* of *Baptism*: which, together with the *Chapel*, in these latter days being put to some indecent at least, if not profane use, was carefully and piously rescued from it, by some of the Right Worshipful Family of the *Browns* of *Nether Kiddington*, where it now remains in the garden of that worthy Gentleman Sir *Henry Brown* Baronet, set handsomly on a pedestal as exactly represented *Tab. 16. Fig. 6.* and adorned with a *Poem* rather pious than learned, which yet I think I had put down, but that it is imperfect.

125. Which holy King *Edward* was the first to whom was granted the gift of *Sanation*, only with the touch of his hand, of the Disease called the *Struma*, or *Scrofula*, and in English upon this account, the *Kings Evil*; which as a mark of *Gods* most especial favor to this *Kingdom*, has been transmitted with it, as an *hereditary* gift to all his *Successors*: Every *sacred* hand in all Ages ever since, that has held the *Scepter* of this most happy and now flo-

^c *Camd. Britan. in Com. Oxon.* ^h *Vid. Monasticon Angl. vol. 1. p. 59.*

rishing *Kingdom*, having been signally blest by divers and undoubted *Experiments* of healing that Disease.

126. Before they *touch* for this distemper, they have always *Prayers* read suitable to the *occasion*, both which when performed, the King forthwith bestows on every *Patient*, a piece of *Angel-gold* purposely coined, and put upon a *white ribbon* to be hung about the neck; which as long as worn preserves the virtue of the *touch*, though Dr. *Tooker* will have it only, *Sanitatis symbolum inchoatæ, & Eleemosynæ sacræ monumentum*¹, i. e. a mark that the *Cure* is already begun, and a lasting memorial of the Kings charity and piety to the poor *patients*.

127. However it be, that this was the custom *ab initio*, I take to be plain from that piece of *Gold* of King *Edward* the *Confessor*, *Tab. 16. Fig. 5.* found in St. *Giles's* field in the Suburbs of *Oxon.* having the *initial letters* of his name over the hinder part of the head, and two small *holes* through it, as if designed to be hung on a *ribbon* for the purpose above-mention'd, the *holes* being strengthened with *Gold Wire* fastened round them, and to the piece it self, much after the fashion of the eye of a mans doublet, as exactly described in the Figure, *ut supra*; which piece was lent me by that courteous Gentleman Sir *John Holeman* Baronet, in whose possession it now remains at his House near *Northampton*.

128. From King *Edward* the *Confessors* being born at *Islip*, 'tis easie to collect, that his Father King *Æthelred* must necessarily have had a *Royal Seat* there, as in all probability likewise at *Heddington* near *Oxford*; for though Tradition now goes, that it was but the *Nursery* of the Kings Children, whereof there remains yet upon the place some signs of foundations in a Field near the Town, called *Court-close*; yet it is plain, that King *Æthelred* did somtimes at least reside there himself, for he concludes a *Charter*, or some such like *Instrument*, wherein he grants *Privileges* to the Monastery of St. *Frideswide* here in *Oxon.* of his own *Restoration*, in English thus, *This privilege was idith at Hedinton*, and after in *Latin*, *Scripta fuit hæc Cedula jussu præfati Regis in villa Regia quæ appellatur, die octavarum beati Andreæ Apostoli, his consencientibus p qui subtus notati videntur. Ego Æthelredus Rex hoc privilegium, &c*^k.

¹ Gul. Tookeri Charisma sive donum Sanationis, Reg. Ang. cælitus concessum. ^k Monasticon Anglican. Vol. 1 inter addenda, pag. 98A.

129. Beside these, the Kings of England had several other seats within this County (not to mention again that Woodstock was one, or that old Alcester was the seat of Alectus) such as Beaumont, just without the suburbs of Oxford, the Birth-place of the valiant King Richard the First. Langley, upon the edge of the Forest of Whichwood, a seat, as Tradition has deliver'd it down to us, of the unhappy King John, who perhaps during the time of his Residence here, might indeed build the Castle of Bampton, which also Tradition informs us was of his foundation. And Ewelme, built indeed by William De la Pool Duke of Suffolk, who marrying Alice the daughter and heir of Thomas Chaucer, had a fair Estate hereabout; but after, upon the attaindure of John Earl of Lincoln, and Edmund his brother, Grand-children to the Duke, it came to the Crown in the days of King Henr. 7. and was afterward made an Honor, by laying unto it the Manor of Wal-lengford, and several others, by King Hen. 8. All which houses are mark'd out in the Map, by the addition of a small Imperial Crown placed somewhere near them.

130. As all places that gave title to ancient Barons, most of whose Families long since have been extinguish'd, are mark'd with a Coronet; such are, 1. The Baronies by ancient Tenure, which were certain Territories held of the King, who still reserved the Tenure in chief to himself: whereof the ancientest in this County were those of Oxford and St. Valeric, the head of the latter being the Town of Hoke-Norton^e, both given by the Conqueror to Robert D'Oyly who accompanied him out of Normandy^f. 2. The Barony of Arsic, belonging to Manasser Arsic, who flourish'd An. 1103. 3 Hen. 1. the head of which Barony was Coggs near Witney, Summertown and Hardwick in this County, being other members of it. 3. The Barony of Hedindon, now Heddington, given the 25 of Henr. 2. to Thomas Bassett in Fee-farm, whose Son Gilbert the Founder of Bisseter Priory, in the first year of Richard the First, was one of the Barons that attended at the Coronation. And these are all the Baronies of ancient Tenure that were heretofore in Oxford-shire.

131. In the beginning of the Reign of King Edward the First, there were several other able men summon'd as Barons to Parliament, that had not such Lands of ancient Tenure, as those above

^e Camd. Britan. in Com. Oxon. ^f Monasticon. Angl. vol. 2. p.

had, which were therefore stiled *Barons* by *Writs* of *Summons* to *Parliament*. The first of these in *Oxford-shire* was *William de Huntercomb* (whose *seat* still remains by the same name in the Parish of *Tuffield*) who was summoned to *Parliament* by the *Kings Writ*, bearing date the 23 of *Edw. 1.* The second, I find, was *Job. Gray* of *Rotherfield*, whose *Ancestors* being of a younger House of *Walter Grey* Arch-Bishop of *York*, had *Rotherfield* given them, beside many other *possessions* by the said Arch-Bishop: He was summoned first to *Parliament* the 25 of *Edw. 1.*

132. And so was thirdly, his next Neighbor *Ralph Pipard* of the other *Rotherfield*, in the same year of the same *King*, their *seats* having now almost quite changed their *names*, for those of their *owners*; one of them seldom being called otherwise than *Pipard* or *Pepper*, and the other *Grays*. Also fourthly, *John* Baron *Lovel*, of *Minster-Lovel*, whose *ancestors* though *Barons* by *tenure* many years before, as seised of the *Barony* of *Castle-Cary* in *Somerfet-shire*, yet dis-possessed of that I know not by what means, received *summons* to *Parliament* whilst seated here at *Minster*, 25 of *Edw. 1.*

133. The fifth of these *Barons* was *Hen. le Tyes*, who having a grant of *Sherbourn* here in *Oxford-shire* from *Richard* Earl of *Cornwall*, temp. *Henr. 3.* which *Sherbourn* had formerly been a part of the *Barony* of *Robert de Druis*, was summoned to *Parliament* the 28 of *Edw. 1.* And so was sixthly, *John de la Mare* of *Garsington*, the very same year. To which should be added, the *Barons* by *Letters Patents* of *Creation*, so first made about the 11 of *Rich. 2.* But of these, whose *Barony* is now vacant, there is only, seventhly, the Lord *Williams*, solemnly created Lord *Williams* of *Thame* the first of *April*, 1 *Mariae*, who had also *summons* the same time to the *Parliament* then sitting, but his *Patent* it seems was never enrolled.

134. For this account of these *Baronies*, I acknowledge myself beholding to that Learned *Antiquary*, *William Dugdale* Esq; *Norroy King at Arms*, in whose elaborate *Volumes* of the *Baronage* of *England*, the *Reader* may receive more satisfaction concerning them. Yet beside these, as the people will have it, the *Manor* of *Wilcot* was the head of a *Barony*, one of the *Barons* whereof, as tradition tells them, lies buried under a fair *Monument* in *North-Leigh* Church: But the *Writings* of the present *Proprietor*, my
worthy

worthy Friend Mr. *Cary* of *Woodstock* (whom yet I found inclined to believe some such thing) being at *London*, whereby otherwise it possibly might have been proved, and the testimony of the people being too weak an evidence to build upon; I have rather chosen to forbear, then add a *Coronet* to the place.

135. Beside the *Saxon* and *Danish* Fortifications above-mentioned, there are others here in *Oxford-shire* of a later date, either quite *raised*, or in a manner useless, and some of them too, known but to few; wherefore I have thought fit to give this short account of them. To pass by therefore the *Castle* of *Oxford*, so well known to be built by *Robert d'Oyly* who came in with the *Conqueror*, and the *Castles* of *Bampton* and *Banbury* spoken of before: the first that presents it self to my consideration, is the old *Castle* of *Deddington*, formerly *Dathington*^g, which I take to be ancient, and the very place no question to which *Aymer de Valence*, Earl of *Pembroke*, brought *Piers de Gaveston* the great Favorite of King *Edward* the Second, and there left him to the fury of the Earls of *Lancaster*, *Warwick*, and *Hereford*, who carrying him to *Warwick*, after some time, caused him to be beheaded in a place called *Blaklaw*, in their own presence^h.

136. Secondly, the *Castle* of *Ardley*, the Foundations whereof are yet to be seen in a little Wood west of the *Town*, which if any heed may be given to the tradition of the place, flourish'd about the time of King *Stephen*: and so perhaps thirdly, might *Chipping-norton* *Castle*; free leave being given at the beginning of his Reign, to all his Subjects to build them *Castles*, to defend him and them against *Maud* the *Empress*, which at last, finding used sometimes against himself, he caused no less than eleven hundred of these new built *Castles* to be raised again, which no doubt is the cause we find no more of them, but their bare *Foundations* and *Trenches*.

137. But fourthly, the *Castle* of *Middleton*, now *Middleton-stony*, was none of these, for I find *Richard de Camvil* had *Livery* given him of *Middleton* *Castle* in *Oxford-shire* (which must needs be this) the tenth of King *John*, as part of his own *Inheritance* by descent from his *Father*ⁱ. And fifthly, as for the ruins of old Fortifications at *Craumersh*, or *Croamish* *Giffard* near

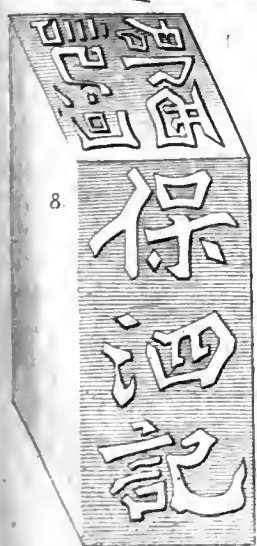
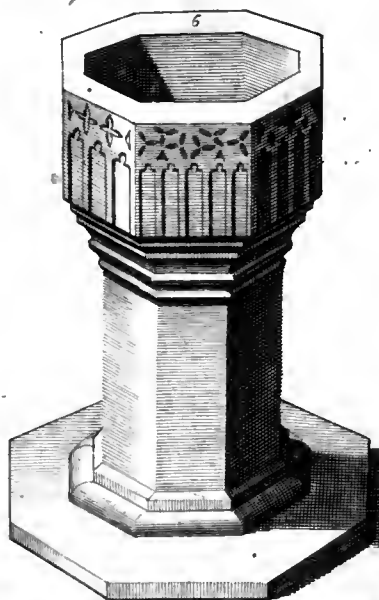
^g *Thomas de la Moor* in *Hist. vitæ & mortis* *Edw.* 2. in principio. ^h *Ibidem*. ⁱ See Mr. *Dugdale's* *Baronage of England*. vol. 1. *Bar. Camvil*.

Wallengford, I take them either for the foundations of that wooden Tower erected by King *Stephen*, in the year 1139. when he besieged *Maud the Empress*, and her Brother *Robert* Earl of *Glocester* in *Wallengford Castle*^k, or else of the Castle of *Craumerse*, or *Croamish* it self, built by the same King *Stephen* at another siege of *Wallengford*, An. 1153. which *Henry Fitz-Empress* endeavoring to raise, and bringing King *Stephen* to great straits, they came atlast to an accord concerning the Kingdom of *England*^l.

138. There are some other *Antiquities* of yet later date, that I have met with in *Oxford-shire* also perhaps worthy notice, such as that odd bearded Dart, *Tab. 16. Fig. 7.* having the beards issuing from it, not as usually one against another, but one lower and the other higher, perhaps thus contrived for its easier passage in, and as great or greater difficulty to get it out of a body; which were it not for the too long distance of time, I should be willing to take for the *Materis*, *Mataris*, or *Matara*, the *British* long Dart, which were usually thrown by those that fought in *Effedis*^m: But the stem of it being wood, and not very hard neither, I cannot afford it to be above 200 years standing, or thereabout: Nor can I add more concerning it, but that it was found somewhere about *Steeple Barton*, and given me by the Worshipful *Edward Sheldon* Esq;

139. Yet the stone engraven *Tab. 16. Fig. 8.* dug up in the garden, and now in the possession of the Right Worshipful Sir *Thomas Spencer* Baronet, a most cordial *Encourager* of this undertaking, can scarce be allowed so ancient as that, the Character upon it in *Rilieve* work being certainly *China*: For unless we may imagin it brought thence in the days of King *Ælfred*, by *Swithelin* Bishop of *Sherbourn*, *Qui detulit ad Sanctum Thomam in India Eleemosynas Regis Aluredi, & incolumis rediit*ⁿ, i. e. who carryed the offerings of King *Alfred* to the Church of *St. Thomas* in *India*, and returned safe, we can by no means allow it to have been here, 180 years; that *Country* having been quite lost again to this *Western* part of the world, till *Vasquez Gama* was sent by *Emanuel* King of *Portugal* to make new discoveries, in the year 1497. In which year, though he recovered the way again to the *East Indies*, yet *Fernandus Andradius* discover'd not *China* till 1517^o. So that

^k *Chronica Gervasii Dorobornensis, & Floren. Wigorn. in An. citato.* ^l *Chron. Gerv. Doroborn. in An. citat.* ^m *Jul. Cesar. Comment. de bello Gallico, lib. 4.* ⁿ *Jab. Bromton Ab. Jorn. in An. 15. Regis Aluredi.* ^o *Hieronymi Orosii Hist. Lusitan. lib. 11.*



provided this *stone* (which is very unlikely) were brought thence by some of *Andradius* his company the very first *voyage*, yet it can be (with us) but 160 years standing.

140. As for the *Stone* it self it is of an odd kind of *texture*, and *colour* too, not unlike (to sight) to some sort of *cheese*, exactly of the *figure* and *bigness* as engraven in the *Table*; and most likely of any thing to have been one of their *Togrâ's*, or *Stamps*, wherein the chief *persons* of the *Eastern Countries* usually had their *names* cut in a larger sort of *Character*, to put them to any *Instruments* at once, without further trouble. That they have such kind of *stamps*, is clearly testified by *Alvares Semedo*, in his *History of China*: *They Print*, says he, *likewise with Tables of stone*, but this manner of *Printing* serves only for *Epitaphs*, *Trees*, *Mountains*, &c. of which kind they have very many *Prints*; the *stones* which serve for this use being also of a proper and peculiar sort^p, as ours seems to be: So that in all probability the *letters* on this *stone* contain only the *name*, and perhaps the *office*, or other *title* of some person of *Quality*, and therefore hard to be found out; and that it was brought hither by some *Traveller* of the Honorable Family of the *Spencers*, and either casually lost, or carelessly thrown out as a thing of no value.

141. And thus with no small toil and charge, yet not without the assistance of many Honorable *Persons*, whose *names* in due time shall be all gratefully mention'd, I have made shift to finish this *Specimen* of *Oxford-shire*; which I am so far from taking for a perfect *History*, that I doubt not but time and severe *observation* (to which I hope this *Essay* will both encourage and direct) may produce an *Appendix* as large as this *Book*: For that new matter will daily present it self, to be added to some one or other of these *Chapters*, I am so sensibly convinc'd. that even since the *Printing* the first *Chapter* of this *Treatise*, I have found here at home just such another *Echo*, as at Mr. *Pawlings* at *Heddington*, in the *Portico's* of the new *Quadrangle* at *St. John Baptist's College*. And since my writing the *second*, my worthy Friend Dr. *Tho. Taylor* has found so strong a *Chalybeat Spring* in *Fulling-mill-ham-stream* near *Oseney Bridge*, that notwithstanding last hard Winter (when the greatest *Rivers* were frozen) this continued open and smoking all the time, tinging all the *stones* by reason of its not running, nor

^p F. *Alvares Semedo, Hist. Chin. part. 1. cap. 6. sub finem.*

mixing with other water, with a deep *rusty colour*. And thirdly, since the Printing the 48 §. of *Chap. 8.* I have seen a *Lapis Ranula* taken out from under the Tongue of one *Johnson* a Shoo-maker (by the skilful Mr. *Pointer* Chirurgion) here in *Oxford*.

142. Which is all I have at present to offer the *Reader*, but that he would take notice, 1. That in *Chap. 2. §. 69.* where I mention a *Well* so eminent heretofore for curing *distempers*, in the Parish of *St. Crosses*, that it has given it the more lasting name of *Holy-well*; that I intend not that *Well* of late erection (though perhaps the water of that is as good) and now most used, but an other ancients *Holy-well* behind the *Church*, in Mr. *Nevil's* Court before his house. And that secondly, notwithstanding the authority of the Learned Dr. *Hammond* (with whom a man need not much be ashamed to err) some will have, that he calls the *Well* of *St. Edward* in the Parish of *St. Clements*, rather the *Well* of *St. Edmund*, for which I find the very same *authority* alleged, that Dr. *Hammond* brings ⁹. And lastly to beg of him, that though in general he find me unequal to my *design*, and many particulars of this *Essay* perhaps ill placed, and worse expressed, that yet in consideration that this is my first *attempt* (wherein many *Inconveniencies* could not be fore-seen, which may hereafter be avoided) he would candidly accept of the *sincerity* of my intention, with all imaginable endeavor of *amendment* for the future, in lieu and excuse of my present *Inabilities*.

⁹ Vid. Hist. & Antiq. Univ. Oxon. lib. 2. pag. 10. col. 1.

F I N I S.

ERRATA.

IN the Map, the Crown belonging to *Ewelme*, is mis-placed at *Benson*; and the mark for *Banbury* Castle wanting. In Tab. 7. Fig. 9. for *bb* read *aa*; and for *cc* read *bb*. In the Book, p. 34. line 4. for *nearest*, r. *mearest*. p. 56. l. 14. for *parts*, r. *forts*. p. 98. l. 8. r. *with metals*. p. 151. l. 29. r. *white Cone*. p. 155. l. 18. for *Hampton*, r. *Bampton*. p. 231. l. 27. r. *adaptata*. p. 253. l. 21. r. *indace*. p. 280. l. 2. r. *stained*. p. 323. l. 32. r. *regum*. p. 344. l. 31. r. *65' 74 76*.

THE
BOOK OF THE
MAGNETIC
FLUID
BY
J. H. P. COLEMAN
M.D. 1880

T H E I N D E X.

Wherein the first Figure signifies the Chapter,
the rest that follow, the Paragraph.

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